
Hampton Armory


Hampton Armory

Hampton Armory

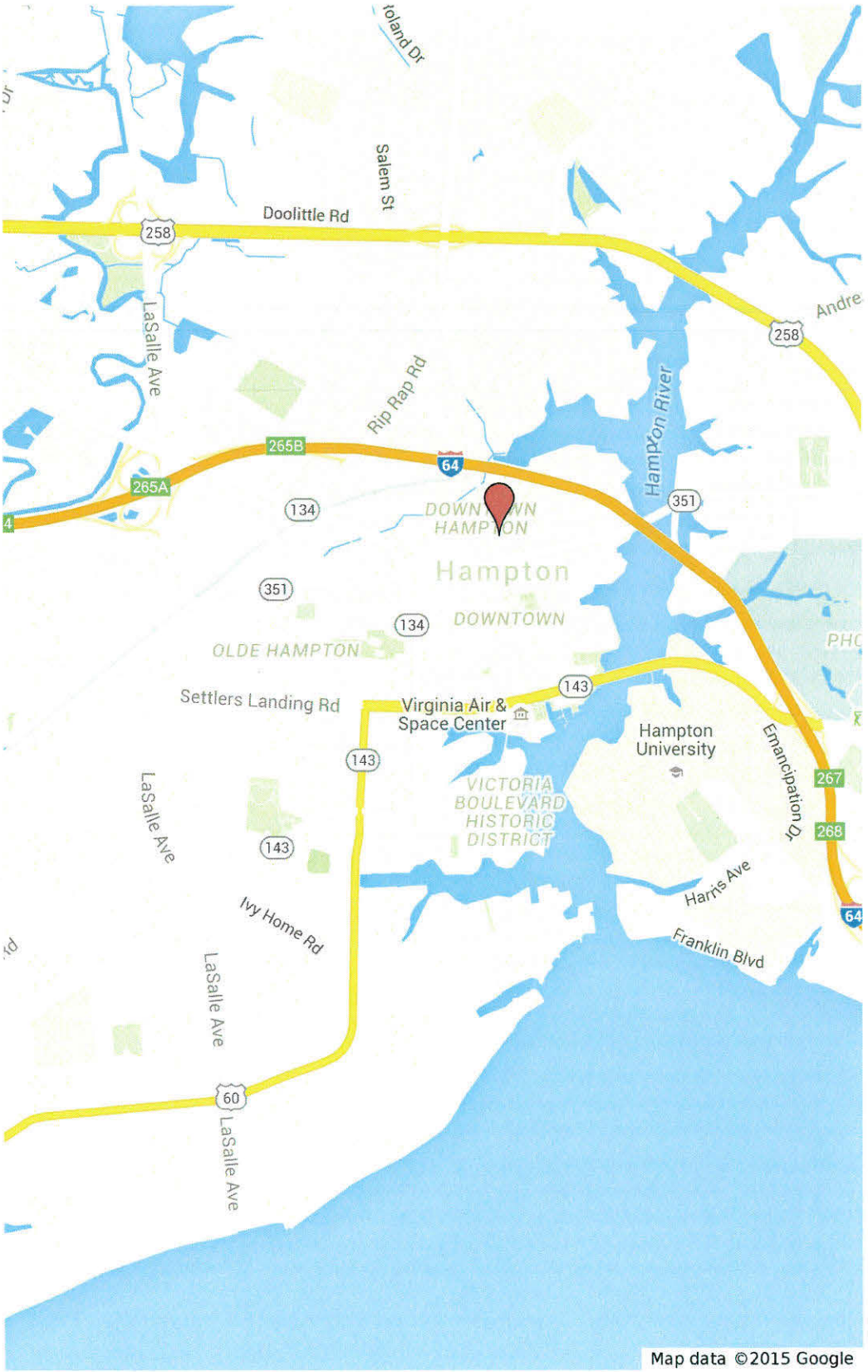
Hampton Armory


Hampton Armory

HAMPTON ARMORY

Untitled layer

504 N King St



Legend

- Parcels
- Boundary

Feet

0 200 400 600 800

Map Scale: 1:9,028

Title: HAMPTON ARMORY **Date: 9/24/2015**

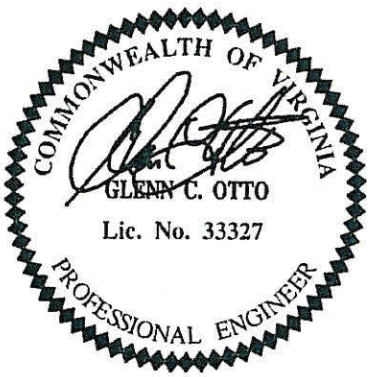
DISCLAIMER:This drawing is neither a legally recorded map nor a survey and is not intended to be used as such. The information displayed is a compilation of records,information, and data obtained from various sources, and Hampton is not responsible for its accuracy or how current it may be.

McPHERSON DESIGN GROUP p.c.
STRUCTURAL ENGINEERS

STRUCTURAL CONDITION ASSESSMENT AND FEASIBILITY STUDY

for

HAMPTON ARMORY
HAMPTON, VIRGINIA



SUBMITTED TO:

City of Hampton
Hampton Redevelopment and Housing Authority
811 West Pembroke Avenue
Hampton, Virginia 23669

June 9, 2010

HAMPTON ARMORY
STRUCTURAL CONDITION ASSESSMENT AND FEASIBILITY STUDY
HAMPTON, VIRGINIA

McPHERSON DESIGN GROUP p.c.
STRUCTURAL ENGINEERS

Structural Engineers with Practical Solutions

HAMPTON ARMORY
STRUCTURAL CONDITION ASSESSMENT AND FEASIBILITY STUDY
HAMPTON, VIRGINIA

McPHERSON DESIGN GROUP p.c.
STRUCTURAL ENGINEERS
Structural Engineers with Practical Solutions

INTRODUCTION

The Hampton Armory building, owned by the City of Hampton, is under the responsibility of the Hampton Redevelopment and Housing Authority. The building was constructed in 1936, with various subsequent modifications and is primarily a two-story brick and wood structure. The front and rear sections are two-story with a flat roof and parapet type of construction. The central large area is a gymnasium or auditorium. The gymnasium is two-stories in height, utilizing steel trusses to create the sloped roof that is finished with slate. Photos A, B, and C shows the front, west facing side and the left and right side oblique views.

There is a small partial basement centralized in the rear section. Otherwise, crawl space foundations are used for the front and rear. The foundation under the kitchen and the latrine/showers in the rear portion appear to be a slab on grade. There is an underground pipe chase on the south side of the building leading from the front crawl space to the rear of the building. The gymnasium consists of a wooden floor placed on wooden sleepers bearing on a raised grade so that it is about 1-foot above the surrounding exterior grade. The walls of the building are 13 to 17 inch thick multi-wythe brick masonry. The wooden floor framing of the front and rear portions bear in the masonry walls.

The following report discusses the structural condition of the building and provides the feasibility analysis for adding a second floor at the central gymnasium and/or auditorium. It is important that a second floor be added in order to provide enough future space for the possible occupancy by the Hampton Redevelopment and Housing Authority.

The building is a candidate for historic restoration and we understand that an Architectural Historian has been consulted to assist in that endeavor. Some of our recommendations may be affected by historic considerations.

HAMPTON ARMORY
STRUCTURAL CONDITION ASSESSMENT AND FEASIBILITY STUDY
HAMPTON, VIRGINIA

McPHERSON DESIGN GROUP p.c.
STRUCTURAL ENGINEERS
Structural Engineers with Practical Solutions

EXECUTIVE SUMMARY

The scope of work involved in the Structural Assessment and Feasibility Study for the Hampton Armory includes a field investigation of the structural condition of the building, preparation of the report and a feasibility analysis for adding a second floor at the central gymnasium and/or auditorium.

The building was originally used for the Virginia National Guard. The Virginia National Guard moved to a new building and had other users until the building was abandoned. The neglect of the building has led to deterioration of several components. Some deterioration has occurred due to its age and design.

The front and rear two-story portions have a flat roof, which require a lot of maintenance no matter what method or materials are used to construct them. The deterioration of the flat roofs and the subsequent leakage is the main cause of most of the damage to the building. The water leaks have caused extensive damage to non-structural finishes and structural members as well. The plaster walls have moisture damage and structural members have decayed. Many areas of the exterior brick, especially around the roof parapets, are in bad shape.

The paint on the walls and ceilings is peeling and the debris covers the floors to one extent or another. Due to the age of the building, the paint probably contains lead and will require abatement or removal.

The plumbing is not extensive, but some limited areas still have asbestos insulation, which will need to be managed also.

The main central area is a high gymnasium/auditorium with a sloped roof supported by steel trusses and finished with slate. The slate is in fairly good condition, but there are some roof leaks, missing slates and trim. The wooden gym floor, being structurally supported on grade, has severe moisture damage.

A second level or mezzanine will be viable to construct within the gymnasium/auditorium in regards to height and structural considerations. Of course, footings will need to be added and adequate structural members to provide strength and stability independent of the existing structure.

RESULTS OF OUR FINDINGS

Facility Condition

The neglect of the building has led to deterioration of several components. Some deterioration has come about just because of its age and design.

The front and rear two-story portions have a flat roof, which are require a lot of maintenance no matter what method or materials are used to construct them. The deterioration of the flat roofs and the subsequent leakage is the main cause of most of the damage to the building. The water leaks have caused extensive damage to non-structural finishes and structural members as well. The plaster walls have moisture damage and structural members have decayed. Many areas of the exterior brick, especially around the roof parapets are in bad shape.

Paint has flaked off of the walls and ceilings throughout the facility. Given the age of the structure, the paint probably has lead, so a lead abatement will likely be required.

Given the age of the structure, an asbestos survey will be required. There is not a lot of plumbing, so this should be relatively minor.

As indicated on the attached drawings and in photographs in the appendix, the items are sequentially numbered to match the following discussion.

1. The flat roofs of the building are wood-framed and have a wood roof deck. The finish is a coated membrane that is aged and deteriorating. The roofs have many leaks and are in need of maintenance and repair or possible replacement. The brick forming the roof parapet is in poor condition throughout much of the front portion and a significant portion of the rear portion. The coping is either missing, poorly formed, or loose so that it is allowing water to get between the brick and/or penetrate to the inner softer core. When the water penetrates the gap between wythes, it can freeze and expand which causes damage by popping out the face layer of the outer brick wythe. Once the brick facing is damaged, the brick must be replaced, because the inner core is softer and more absorbent which accelerates the breakdown.

2. The coping can be seen in this photograph to be missing and loose resulting in water penetration into the brick discussed in (1) above.

3. The roof hatch has had some previous leaks, which have caused damage to the scuttle framing and the flooring below. There is damage all the way to the first floor ceiling. The wood flooring is decayed and possibly the joists as well.

4. The front roof is leaking into the walls at the top of the north stair landing. The flashing at the parapet wall allows the penetration resulting in mold and plaster damage.

5. The front roof scupper at the south end is not flashed properly at the penetration through the parapet and is not connected to the downspout. Water has penetrated to the inside of the roof framing and caused ceiling damage.

6. The front roof scupper at the north end is not flashed properly at the penetration through the parapet and is not connected to the downspout. Water has penetrated to the inside of the roof framing and caused ceiling and wall damage in the first and second floors.

7. The trussed roof has some roof damage on the south slope where daylight can be seen through the holes. The existing roof trusses are in good condition. No areas of rust were visible.

8. The slate roof is in fairly good condition, but about 5 percent is missing. The missing pieces can lead to leaks and are difficult to replace. The roofs are slippery and brittle. We recommend removing and selling the salvaged slates and replacing with an artificial slate or asphalt shingles.

9. The auxiliary room to the south side was inaccessible. The roof has a large hole at the southwest corner extending to the east. The framing is decayed at the ends.

10. The crowns at the top of the pilasters have gaps allowing water penetration behind and under the crown and in between the wythes. The weathering eventually breaks apart the brick.

11. The south chimney is heavily damaged at the top. Bricks are missing and there are also cracks running somewhat vertically. I could not see down into the chimney to see the condition or existence of the flue. The chimney will need to be reconstructed at the top and have a cap placed on top. If the chimney is to be used, the flue will need to be inspected by camera by a certified chimney sweep.

12. The poor condition of the rake and sloped roof edge has allowed moisture penetration. The flat roof ceiling is damaged, but the framing is intact. It appears that there was some light fire damage before the drop ceiling in the second floor southeast room was installed. The black char stops below the rafter/ceiling joist level where there was formerly a gypsum or plaster ceiling fastened directly to the joists typical of other rooms.

13. The rake and the edge of the roof trim are missing or in poor condition allowing water penetration.

14. There is some roof leak at this corner, which has caused some ceiling damage.

15. The rear roof scupper at the south end is not flashed properly at the penetration through the parapet and the downspout is missing the bottom section, about 10 feet, causing the concentrated flow of stormwater to run down the face of the brick. This condition has caused a great loss of the brick face.

16. The roof membrane and flashing are aged and deteriorating. The roofs have several leaks and are in need of maintenance and repair.

17. The rear roof scupper at the north end is not flashed properly at the penetration through the parapet and the downspout is missing the bottom section, about 10 feet, causing the concentrated flow of stormwater to run down the face of the brick. This condition has caused a great loss of the brick face.

18. The front roof scupper at the north end is not flashed properly at the penetration through the parapet and the downspout is not connected. Water has penetrated to the inside of the roof framing and caused ceiling damage.

19. Water has penetrated the roof at some point and has damaged the ceiling. The damage appears localized with no signs of structural problems.

20. The coping along the parapet is loose and hold-down nails are pulling out. Coping should be held down at the overlaps on the sides. The nails create penetrations that allow water to enter and eventually deteriorate and loosen.

21. The interior walls of the second floor are showing mold in the plaster. This indicates that moisture is getting into the walls. The moisture can get in through roof leaks by way of the membrane, the flashing, down through the wythes under the loose cap or through the bricks.

22. The roof scuttle framing is decayed, especially above the roof level. It has allowed water to penetrate, which rotted the second floor in a localized area at the top of the stairwell leading to the southeast room.

23. There is a relatively vertical crack in the wall on the opposite side of the roof scuttle discussed in (22). The wall has a built-in ladder to the roof scuttle that was original. The crack could have one of multiple possible causes – the roof leaks at the scuttle could have caused moisture damage in the studs, the climbing

on the ladder could have shaken the studs, or there may have been impacts against the wall. The cracking pattern does not have characteristics of settling.

24. & 25. The interior walls at the rear bump out have mold in the plaster. There is also plaster damage, especially around the window jambs and sills. These walls are under the higher portion of the roof. The moisture is likely coming down through the wythes, under the loose caps.

26. There are cracks in the wall plaster of the southeast wall. The cracks indicate a moisture problem, again from the roof.

27. The two rooms of the second floor at the north end of the rear wall have severe damage due to moisture leaks. The rafters have some decay as well as the wall studs and plaster. The second and first floor framing and finish have decayed severely in a fairly large area on both floors. The roof scupper over the area is poorly flashed and sealed, the coping is loose, and the downspout is clogged with debris. The conditions cause rainwater to get within the brick wythes and to run down the brick damaging the wall and likely causing an excessive amount of water to be in one area and leaking through the doors and windows.

28. The gym/auditorium floor is a wood slat system bearing on "sleeper" boards that bear on grade soil. The moisture has damaged and curled the slats and has very likely caused decay in the lumber in contact with soil. The flooring system will need to be replaced.

29. The windows are steel mullion, single-thick pane glass. Many of the windows need to be resealed, some are broken, and it is assumed that the paint on all of them contains lead also. The windows, of course, are not energy efficient, so there will likely be some modifications necessary, such as replacing them with energy efficient, wind-resistant types or placing a storm window inside, behind the existing ones.

30. There are a few joists that have termite damage and had repairs made to them by sistering new joists next to them. However, the joists are undersized compared to the joists that they were supposed to replace. Additional joist or additional girders will be required to reduce the span.

31. The first floor joists have decayed and fallen off of the foundation wall. The cause of this decay was discussed in (27), above.

Feasibility of Second Floor over Gymnasium

We have completed our feasibility analysis for the addition of a second floor within the gymnasium/auditorium area. The proposed floor level is needed for future space for possible occupancy of the Hampton Redevelopment and Housing Authority office space.

The second level is to be contained within the existing volume of the gymnasium. In regards to suggestions from a historical buildings consultant, we inset the proposed structure 10 feet on three sides from the existing walls. It will meet against the existing balcony and match the elevation of 10'-5" above the existing floor finish. We have attached

three sketches for the proposed structural framework – second floor framing and foundation plans and section through showing the floor up through the existing roof.

We propose using 12-inch deep steel bar joists, designated 12K5, spaced at 24 inches on center with a 3-inch thick concrete floor slab. Because we are limited on depth, the concrete slab can help dampen vibrations as well as sound transmission. That will leave about 9'-2" to the bottom of the joists. Because the bar joists are steel trusses, the openings will allow HVAC and other utilities to pass to service the first floor. There will be three (3) column lines, spaced a maximum of 20 feet apart. The central beams supporting the joists can be kept to a minimum depth using a W14x61, which is 14 inches deep, whereas the side beams can be W12x40, 12 inches deep. This would leave about 8'-9" of headroom under the central beam and 8'-11" under the side beams.

The foundation will be comprised of concrete spread footings. The largest ones would be under the central columns, about 6-foot square and the side columns would bear on footings about 3'-6" square. Footings are based on typical soil conditions found in the area.

Although there are no wind loads, lateral stability of the structure would be needed for the structure, which will be provided by the perimeter walls.

We recommend using the bottom chord of the existing trusses and light gage metal for the ceiling over the second floor. Attaching to the trusses will add load to the trusses, although very light, so the trusses may need some modification to bear on the new walls, so that the trusses will not be overloaded. If the existing trusses are not

utilized, the ceiling over the second floor will require a more substantial framing – 8-inch, 14 gauge metal studs, with a 2½" flange.

HAMPTON ARMORY
STRUCTURAL CONDITION ASSESSMENT AND FEASIBILITY STUDY
HAMPTON, VIRGINIA

McPHERSON DESIGN GROUP p.c.
STRUCTURAL ENGINEERS
Structural Engineers with Practical Solutions

SUMMARY

The scope of work involved in the Structural Assessment and Feasibility Study for the Hampton Armory included a field investigation of the structural condition of the building, preparation of the report and a feasibility analysis for adding a second floor at the central gymnasium and/or auditorium.

The building was originally used for the Virginia National Guard. The Guard moved to a new building and had other users until the building was abandoned. The neglect of the building has led to deterioration of several components. Some deterioration has occurred due to its age and design.

Many areas of the exterior brick, especially around the roof parapets are in bad shape. The roof parapets will need to be replaced because the facing of the brick has delaminated and there are no patching methods. Water has very likely penetrated between the wythes. Several areas of the brick walls will need replacement, due to excessive water coming down the exterior and has most likely ruined them.

The front and rear two-story portions have flat roofs. The deterioration of the flat roofs and the subsequent leakage is the main cause of most of the damage to the building. The water leaks have caused extensive damage to non-structural finishes and structural members as well. The plaster walls have moisture damage and structural members have decayed. The damage occurs on both floors of the front and rear portions. The rear portion has the worst of the structural damage.

The paint on the walls and ceiling is peeling and covers the floors to one extent or another. We believe the paint probably has lead due to the age of the building and will require abatement or removal.

With the lead paint and the mold on the walls, we anticipate removing and disposing of the plaster finish of the walls and ceilings throughout the structure. The removal of the finish will also expose any hidden structural damage.

The plumbing is not extensive, but some limited areas still have asbestos insulation, which will need to be managed also.

The main central area is a high gymnasium/auditorium with a sloped roof supported by steel trusses and finished with slate. The slate is in fairly good condition, but there are some roof leaks, missing slates and trim. The slates can be sold for salvage value and replaced with asphalt shingles that are easier to access and maintain. The wooden gym floor, being structurally supported on grade, has severe moisture damage. The floor and sleepers will need to be removed and replaced. Historically, you may have to put in another wood floor, which can be constructed on a concrete slab to prevent ground moisture damage. Otherwise, you can install a different type of floor finish.

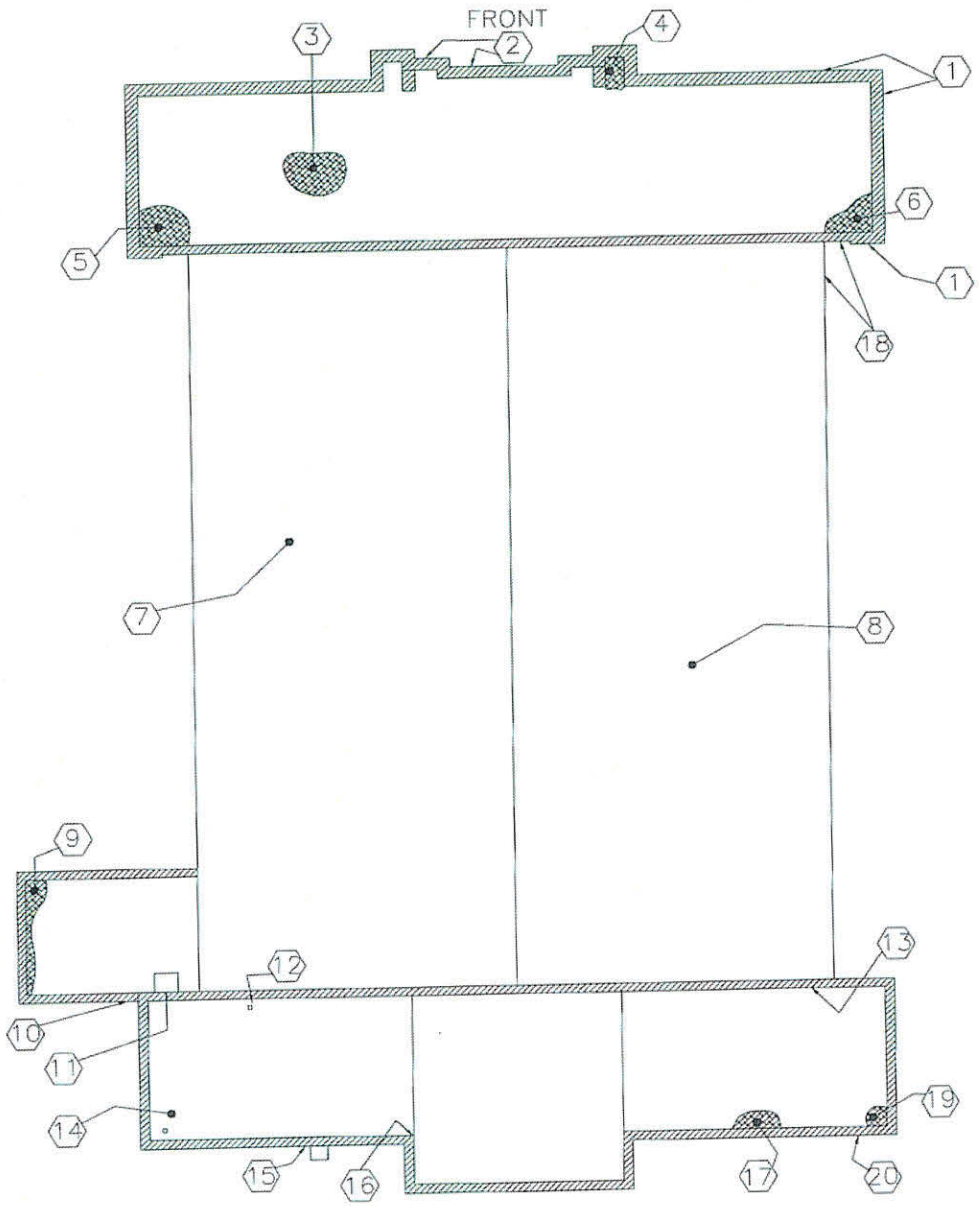
The existing doors are wooden and the exterior ones have varying levels of damage. We anticipate replacing all of the interior and exterior doors. The interior ones are painted, and we would anticipate modernizing them anyway.

The windows are painted steel mullion type. They will likely need lead abatement, but probably removal so as to provide a good base for new paint. They are not energy efficient, being single pane, so either replacement with a modern style or providing a storm window on the inside of them will be in order.

A second level or mezzanine will be viable to construct within the gymnasium/auditorium in regards to height and structural considerations. Steel framing, joists, beams, columns and a concrete second floor slab will provide the most efficient structure and make it possible to fit into the existing space. Footings will need to be added and the perimeter walls of the new structure can be utilized to provide strength and stability independent of the existing structure.

HAMPTON ARMORY
STRUCTURAL CONDITION ASSESSMENT AND FEASIBILITY STUDY
HAMPTON, VIRGINIA

McPHERSON DESIGN GROUP p.c.
STRUCTURAL ENGINEERS
Structural Engineers with Practical Solutions



ROOF PLAN

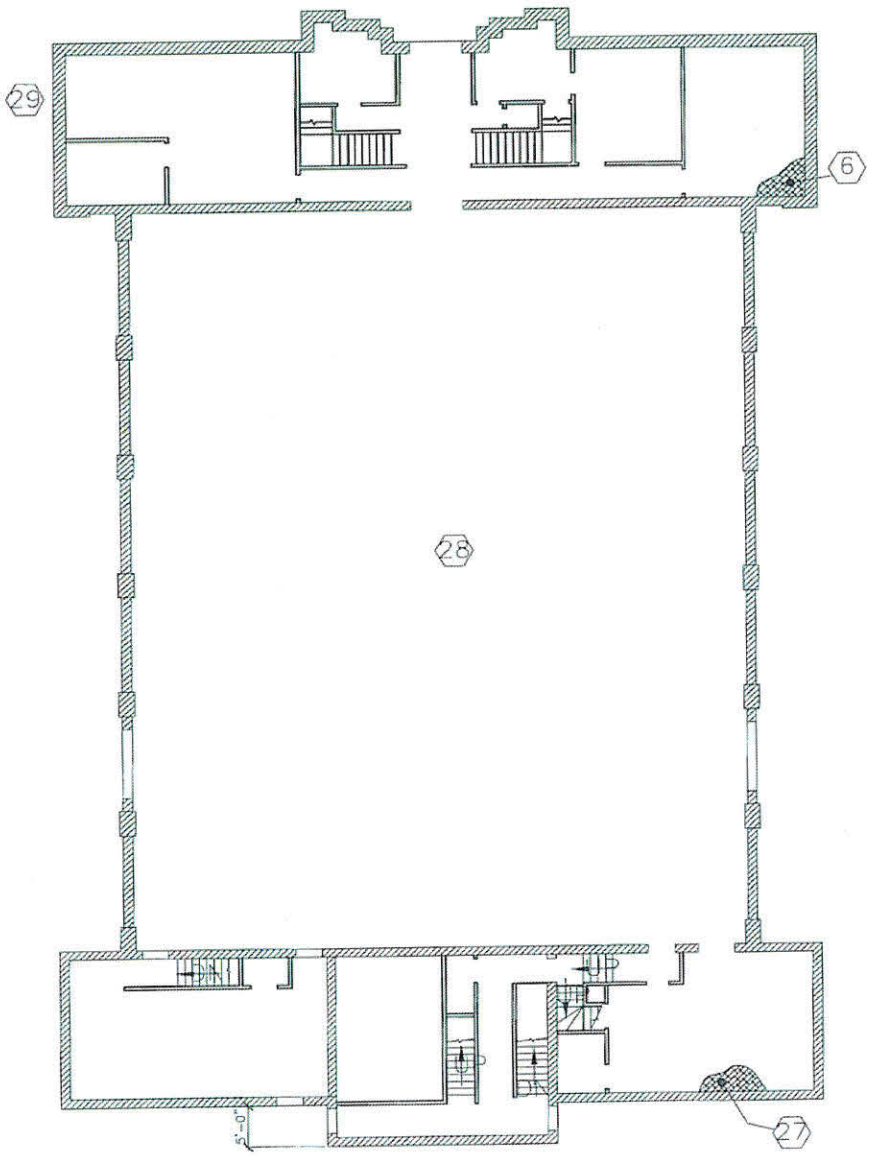
Appendix A

Floor Diagrams

HAMPTON ARMORY
STRUCTURAL CONDITION ASSESSMENT AND FEASIBILITY STUDY
HAMPTON, VIRGINIA

McPHERSON DESIGN GROUP p.c.
STRUCTURAL ENGINEERS

Structural Engineers with Practical Solutions



REAR

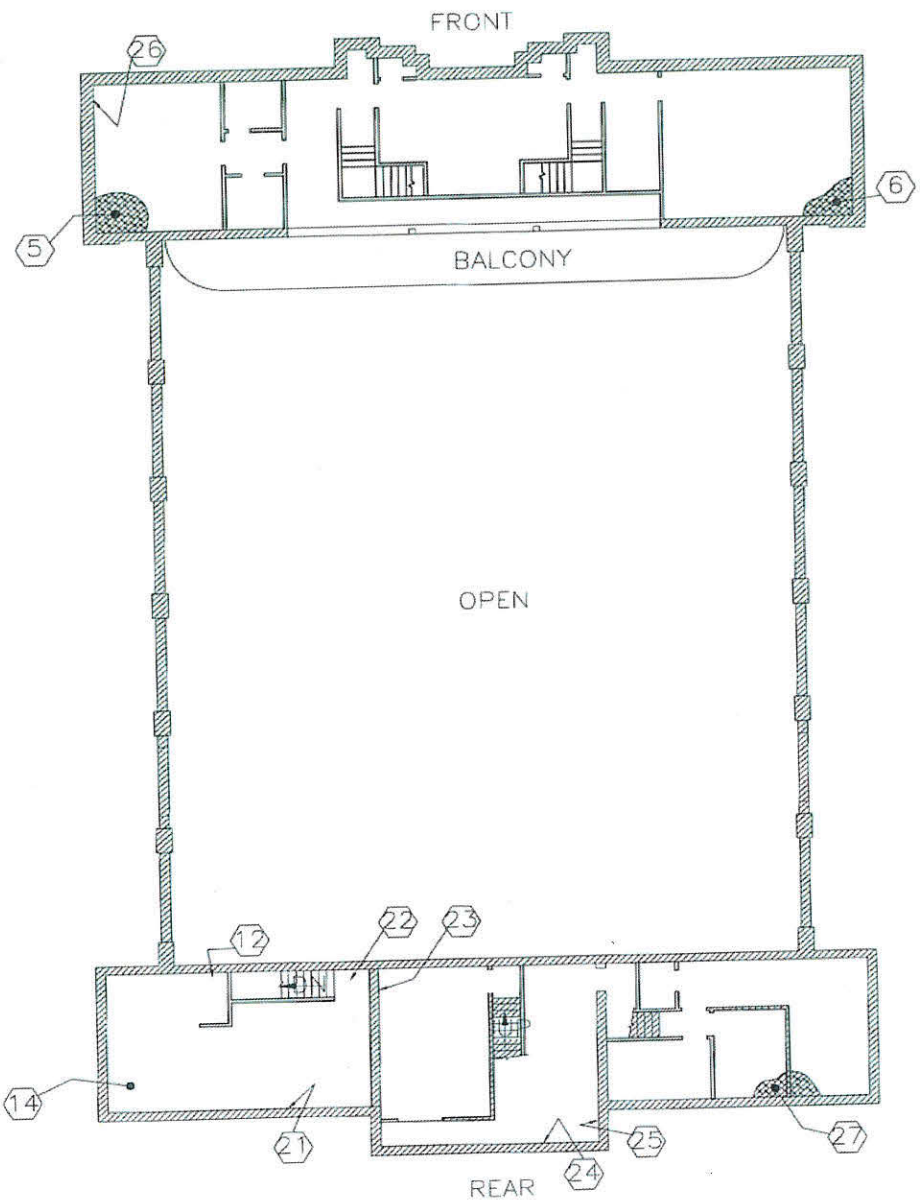
1ST FLOOR PLAN

Appendix A

Floor Diagrams

HAMPTON ARMORY
STRUCTURAL CONDITION ASSESSMENT AND FEASIBILITY STUDY
HAMPTON, VIRGINIA

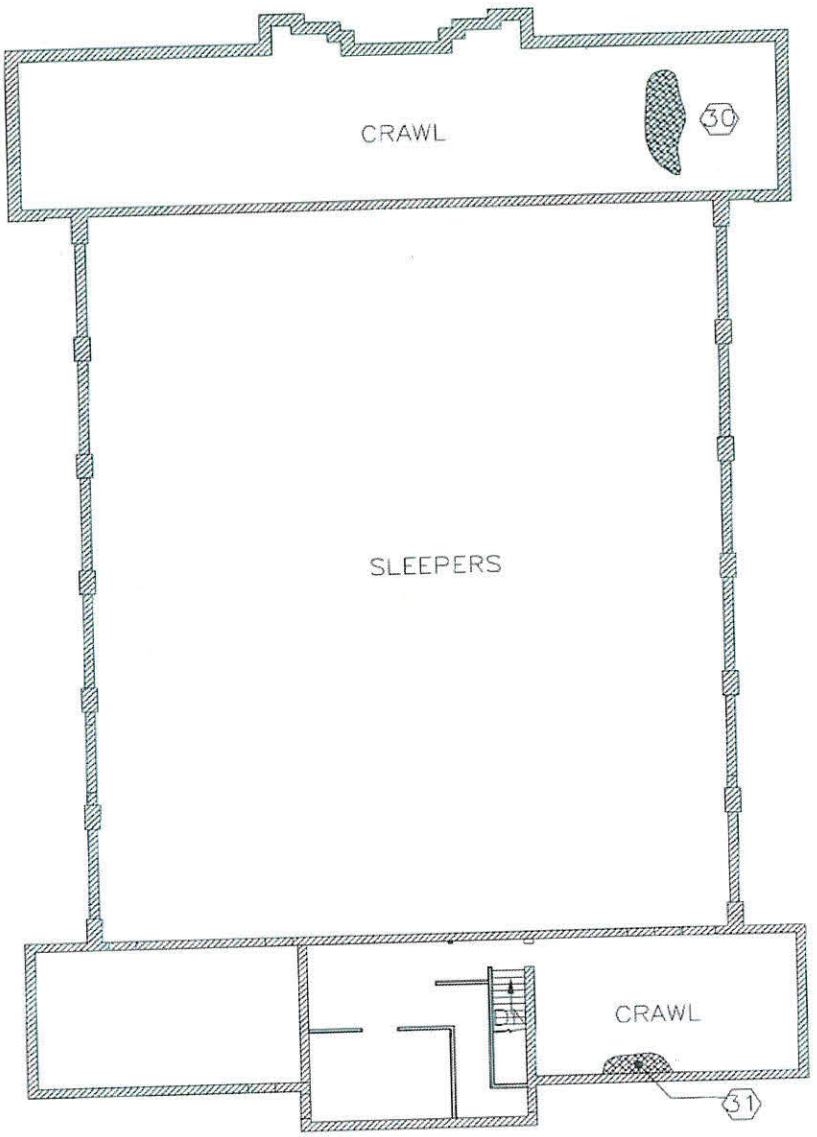
McPHERSON DESIGN GROUP p.c.
STRUCTURAL ENGINEERS
Structural Engineers with Practical Solutions



2ND FLOOR PLAN

Appendix A

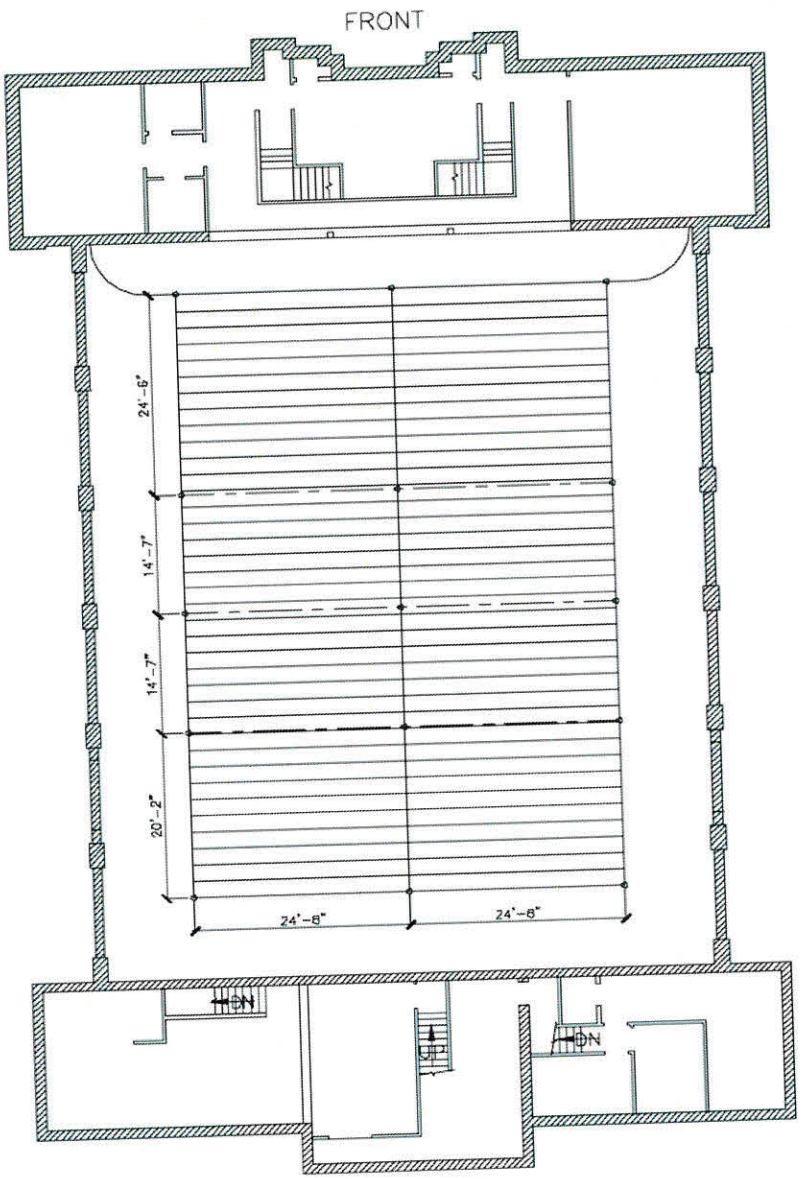
Floor Diagrams



BASEMENT PLAN

HAMPTON ARMORY
STRUCTURAL CONDITION ASSESSMENT AND FEASIBILITY STUDY
HAMPTON, VIRGINIA

McPHERSON DESIGN GROUP p.c.
STRUCTURAL ENGINEERS
Structural Engineers with Practical Solutions



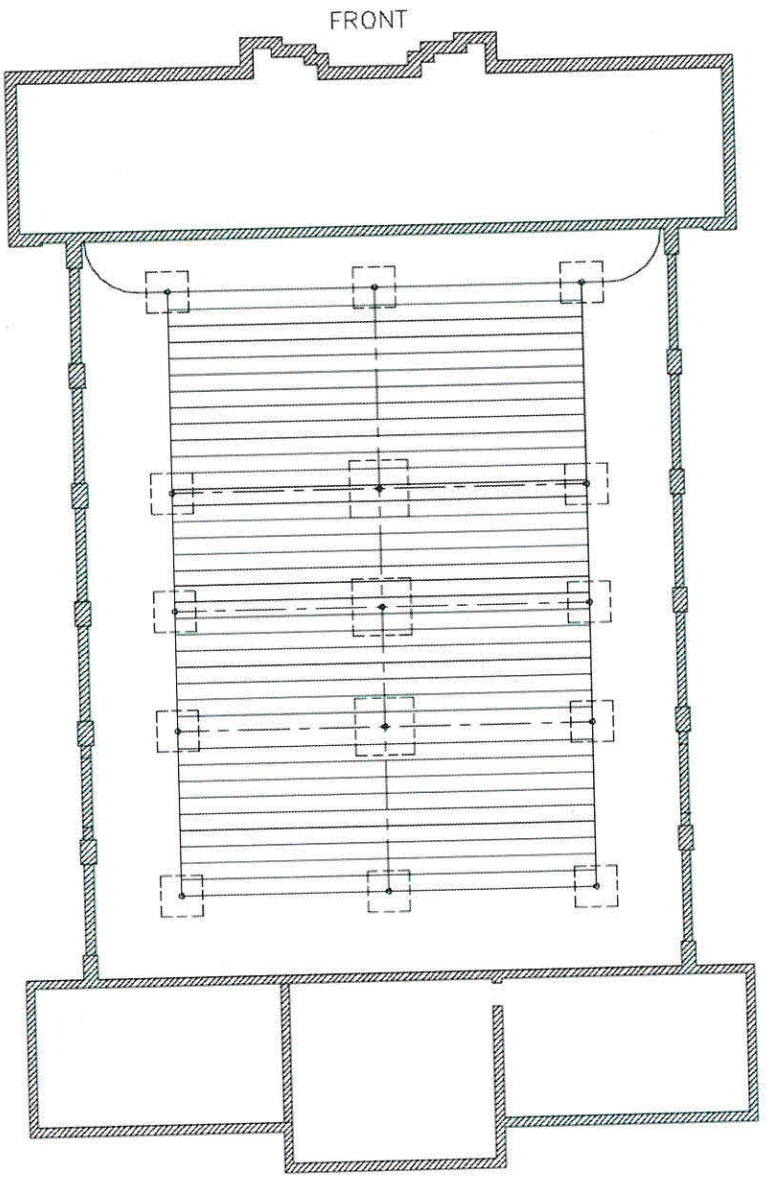
NEW 2ND FLOOR PLAN

Appendix A

Floor Diagrams

HAMPTON ARMORY
STRUCTURAL CONDITION ASSESSMENT AND FEASIBILITY STUDY
HAMPTON, VIRGINIA

McPHERSON DESIGN GROUP p.c.
STRUCTURAL ENGINEERS
Structural Engineers with Practical Solutions



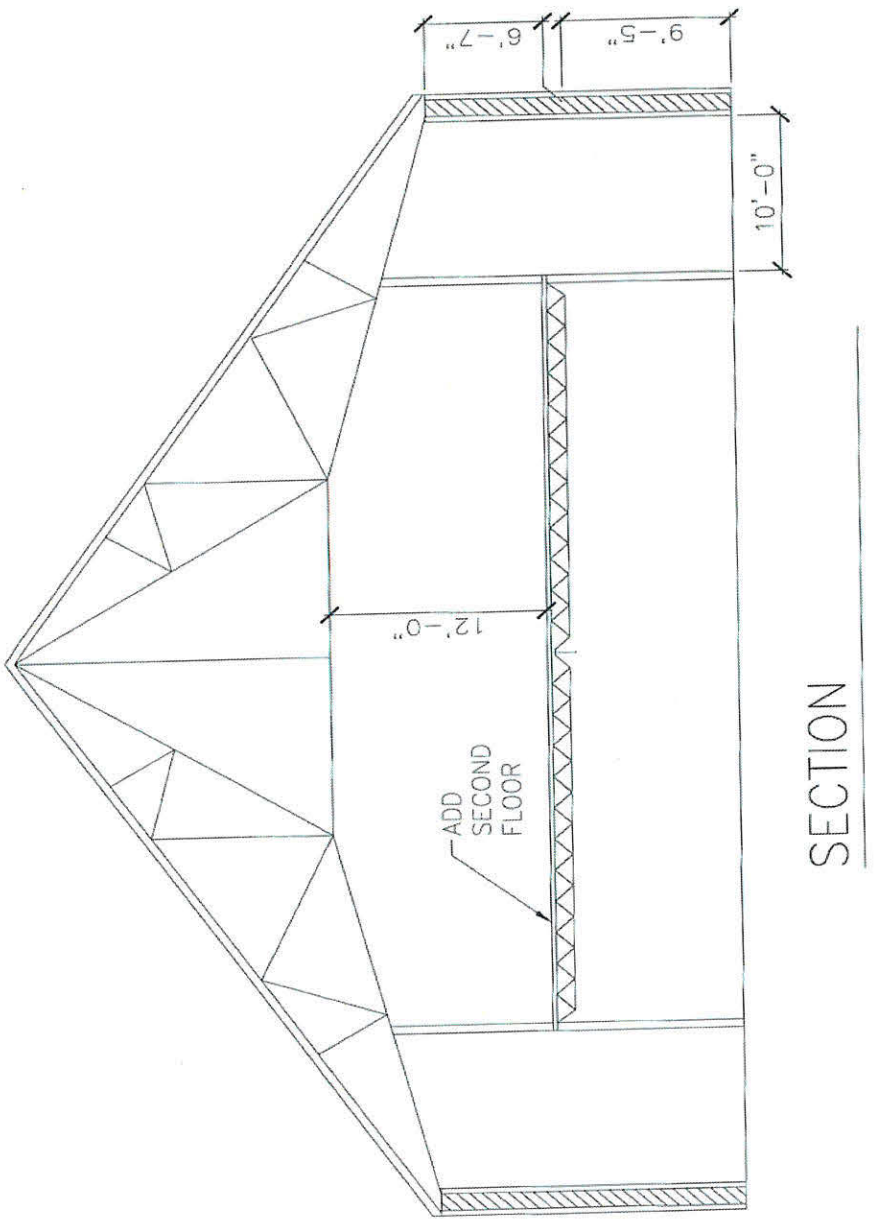
NEW FOUNDATION PLAN

Appendix A

Floor Diagrams

HAMPTON ARMORY
STRUCTURAL CONDITION ASSESSMENT AND FEASIBILITY STUDY
HAMPTON, VIRGINIA

McPHERSON DESIGN GROUP p.c.
STRUCTURAL ENGINEERS
Structural Engineers with Practical Solutions



Appendix A

Floor Diagrams

STANDARD LOAD TABLE
OPEN WEB STEEL JOISTS, K-SERIES

Based on a Maximum Allowable Tensile Stress of 30,000 psi

Adopted by the Steel Joist Institute November 4, 1985; Revised to May 2, 1994 - Effective September 1, 1994

The black figures in the following table give the TOTAL safe uniformly distributed load-carrying capacities, in pounds per linear foot, of K-Series Steel Joists. The weight of DEAD loads, including the joists, must be deducted to determine the LIVE load-carrying capacities of the joists. The load table may be used for parallel chord joists installed to a maximum slope of 1/2 inch per foot.

The figures shown in RED in this load table are the LIVE loads per linear foot of joist which will produce an approximate deflection of 1/360 of the span. LIVE loads which will produce a deflection of 1/240 of the span may be obtained by multiplying the figures in RED by 1.5. In no case shall the TOTAL load capacity of the joists be exceeded.

The approximate joist weights per linear foot shown in these tables do not include accessories.

The approximate moment of inertia of the joist, in 4 inches is: $I_j = 26.767(W_{LL})(L^3)(10^{-6})$, where W_{LL} = RED figure in the Load Table and L = (Span - .33) in feet.

For the proper handling of concentrated and/or varying loads, see Section 5.5 in the Recommended Code of Standard Practice.

Where the joist span is equal to or greater than the span corresponding to the RED shaded area shown in the load table, the row of bridging nearest the mid span of the joist shall be installed as bolted diagonal bridging. Hoisting cables shall not be released until this bolted diagonal bridging is completed installed.

JOIST DESIGNATION	8K1	10K1	12K1	12K3	12K5	14K1	14K3	14K4	14K6	16K2	16K3	16K4	16K5	16K6	16K7	16K9
DEPTH (IN.)	8	10	12	12	12	14	14	14	14	16	16	16	16	16	16	16
APPROX. WT. (lbs./ft.)	5.1	5.0	5.0	5.7	7.1	5.2	6.0	6.7	7.7	5.5	6.3	7.0	7.5	8.1	8.6	10.0
SPAN (ft.) ↓																
8	550															
	550															
9	550															
	550															
10	550	550														
	480	550														
11	532	550														
	377	542														
12	444	550	550	550	550											
	288	455	550	550	550											
13	377	479	550	550	550											
	225	363	510	510	510											
14	324	412	500	550	550	550	550	550	550							
	179	289	425	463	463	550	550	550	550							
15	281	358	434	543	550	511	550	550	550							
	145	234	344	428	434	475	507	507	507							
16	246	313	380	476	550	448	550	550	550	550	550	550	550	550	550	550
	119	192	282	351	396	390	467	467	467	550	550	550	550	550	550	550
17		277	336	420	550	395	495	550	550	512	550	550	550	550	550	550
		159	234	291	366	324	404	443	443	488	526	526	526	526	526	526
18		246	299	374	507	352	441	530	550	456	508	550	550	550	550	550
		134	197	245	317	272	339	397	408	409	456	490	490	490	490	490
19		221	268	335	454	315	395	475	550	408	455	547	550	550	550	550
		113	167	207	269	230	287	336	383	347	386	452	455	455	455	455
20		199	241	302	409	284	356	428	525	368	410	493	550	550	550	550
		97	142	177	230	197	246	287	347	297	330	386	426	426	426	426
21			218	273	370	257	322	388	475	333	371	447	503	548	550	550
			123	153	198	170	212	248	299	255	285	333	373	405	406	406
22			199	249	337	234	293	353	432	303	337	406	458	498	550	550
			106	132	172	147	184	215	259	222	247	289	323	351	385	385
23			181	227	308	214	268	322	395	277	308	371	418	455	507	550
			93	116	150	128	160	188	226	194	216	252	282	307	339	363
24			166	208	282	196	245	295	362	254	283	340	384	418	465	550
			81	101	132	113	141	165	199	170	189	221	248	269	298	346
25						180	226	272	334	234	260	313	353	384	428	514
						100	124	145	175	150	167	195	219	238	263	311
26						166	209	251	308	216	240	289	326	355	395	474
						88	110	129	156	133	148	173	194	211	233	276
27						154	193	233	285	200	223	268	302	329	366	439
						79	98	115	139	119	132	155	173	188	208	246
28						143	180	216	265	186	207	249	281	306	340	408
						70	88	103	124	106	118	138	155	168	186	220
29										173	193	232	261	285	317	380
										95	106	124	139	151	167	198
30										161	180	216	244	266	296	355
										86	96	112	126	137	151	178
31										151	168	203	228	249	277	332
										78	87	101	114	124	137	161
32										142	158	190	214	233	259	311
										71	79	92	103	112	124	147

Steel Beam Design

ENERCALC, INC. 1983-2008, Ver: 6.0.221
Lic. # : KW-06004101 License Owner : mcpherson design group, pc

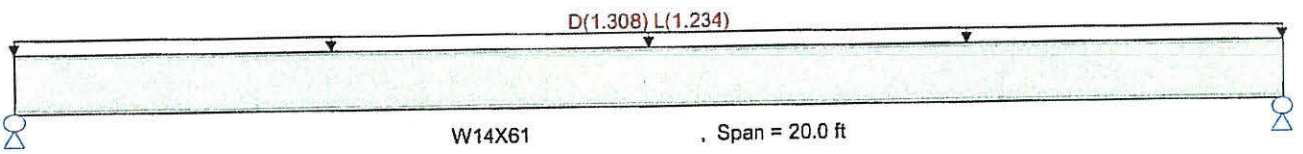
Description : Hampton Armory- Central Beam

Material Properties

Calculations per IBC 2006, CBC 2007, 13th AISC

Analysis Method : Allowable Stress Design
Beam Bracing : Beam is Fully Braced against lateral-torsion buckling
Bending Axis : Major Axis Bending
Load Combination 2006 IBC & ASCE 7-05

Fy : Steel Yield : 50.0 ksi
E: Modulus : 29,000.0 ksi



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loads
Load for Span Number 1
Uniform Load : D = 1.308, L = 1.234 k/ft, Tributary Width = 1.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.511 : 1	Maximum Shear Stress Ratio =	0.250 : 1
Section used for this span	W14X61	Section used for this span	W14X61
Mu : Applied	130.147 k-ft	Vu : Applied	26.029 k
Mn / Omega : Allowable	254.491 k-ft	Vn/Omega : Allowable	104.25 k
Load Combination	+D+L+H	Load Combination	+D+L+H
Location of maximum on span	10.000 ft	Location of maximum on span	0.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward L+Lr+S Deflection	0.241 in
Max Upward L+Lr+S Deflection	0.000 in
Live Load Deflection Ratio	994
Max Downward Total Deflection	0.509 in
Max Upward Total Deflection	0.000 in
Total Deflection Ratio	471

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	Max Stress Ratios V	Summary of Moment Values Mmax +	Mmax -	Ma - Max	Mnx	Omega*Mnx	Cb	Rm	Summary of Shear Values Va Max	Vnx	Omega*Vnx
Overall MAXimum Envelope													
Dsgn. L = 20.00 ft	1	0.511	0.250	130.15		130.15	425.00	254.49	1.00	1.00	26.03	156.38	104.25
+D													
Dsgn. L = 20.00 ft	1	0.269	0.131	68.45		68.45	425.00	254.49	1.00	1.00	13.69	156.38	104.25
+D+L+H													
Dsgn. L = 20.00 ft	1	0.511	0.250	130.15		130.15	425.00	254.49	1.00	1.00	26.03	156.38	104.25
+D+Lr+H													
Dsgn. L = 20.00 ft	1	0.269	0.131	68.45		68.45	425.00	254.49	1.00	1.00	13.69	156.38	104.25
+D+0.750Lr+0.750L+H													
Dsgn. L = 20.00 ft	1	0.451	0.220	114.72		114.72	425.00	254.49	1.00	1.00	22.94	156.38	104.25

Overall Maximum Deflections - Unfactored Loads

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
D+L+Lr	1	0.5089	10.100		0.0000	0.000

Maximum Vertical Reactions - Unfactored

Support & Load Combinati	Support Reaction
Support 1, (D+L+Lr)	26.029 k
Support 2, (D+L+Lr)	26.029 k

Steel Beam Design

ENERCALC, INC. 1983-2008, Ver: 6.0.221

Lic. # : KW-06004101 — License Owner : mcpherson design group, pc

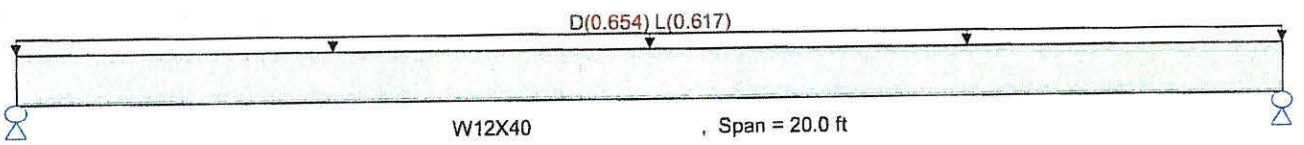
Description : Hampton Armory- Side Beam

Material Properties

Calculations per IBC 2006, CBC 2007, 13th AISC

Analysis Method : Allowable Stress Design
Beam Bracing : Beam is Fully Braced against lateral-torsion buckling
Bending Axis : Major Axis Bending
Load Combination 2006 IBC & ASCE 7-05

Fy : Steel Yield : 50.0 ksi
E: Modulus : 29,000.0 ksi



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loads
Load for Span Number 1
Uniform Load : D = 0.6540, L = 0.6170 k/ft, Tributary Width = 1.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.461 : 1	Maximum Shear Stress Ratio =	0.187 : 1
Section used for this span	W12X40	Section used for this span	W12X40
Mu : Applied	65.541 k-ft	Vu : Applied	13.108 k
Mn / Omega : Allowable	142.216 k-ft	Vn/Omega : Allowable	70.210 k
Load Combination	+D+L+H	Load Combination	+D+L+H
Location of maximum on span	10.000 ft	Location of maximum on span	0.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward L+Lr+S Deflection	0.251 in
Max Upward L+Lr+S Deflection	0.000 in
Live Load Deflection Ratio	954
Max Downward Total Deflection	0.534 in
Max Upward Total Deflection	0.000 in
Total Deflection Ratio	449

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	Max Stress Ratios V	Summary of Moment Values Mmax +	Mmax -	Ma - Max	Mnx	Omega*Mnx	Cb	Rm	Summary of Shear Values Va Max	Vnx	Omega*Vnx
Overall MAXimum Envelope													
Dsgn. L = 20.00 ft	1	0.461	0.187	65.54		65.54	237.50	142.22	1.00	1.00	13.11	105.32	70.21
+D													
Dsgn. L = 20.00 ft	1	0.244	0.099	34.69		34.69	237.50	142.22	1.00	1.00	6.94	105.32	70.21
+D+L+H													
Dsgn. L = 20.00 ft	1	0.461	0.187	65.54		65.54	237.50	142.22	1.00	1.00	13.11	105.32	70.21
+D+Lr+H													
Dsgn. L = 20.00 ft	1	0.244	0.099	34.69		34.69	237.50	142.22	1.00	1.00	6.94	105.32	70.21
+D+0.750Lr+0.750L+H													
Dsgn. L = 20.00 ft	1	0.407	0.165	57.83		57.83	237.50	142.22	1.00	1.00	11.57	105.32	70.21

Overall Maximum Deflections - Unfactored Loads

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
D+L+Lr	1	0.5343	10.100		0.0000	0.000

Maximum Vertical Reactions - Unfactored

Support & Load Combinati	Support Reaction
Support 1, (D+L+Lr)	13.108 k
Support 2, (D+L+Lr)	13.108 k

McPHERSON DESIGN GROUP p.c.
STRUCTURAL ENGINEERS
Structural Engineers with Practical Solutions
office 757.965.2000 • fax 757.965.2001 • 6371 Center Drive • Suite 100 • Norfolk, VA 23502 • www.McPhersonDesignGroup.com

Project:	Hampton Armory	Sht	of	By	Date: 4-Jun-10
Hampton, VA		Comm	10125	Ck:	Date:

Footing Design General Data
Footing supporting steel column

for Columns of Central Girder

Column Loads

DL =	13	kips
LL =	13	kips
Bearing capacity =	1.5	ksf
Concrete strength, f'c =	3500	psi
Column size	8	inches square
Baseplate size	12	inches square
Floor slab thickness	6	inches
Column footing thickness	24	inches
Soil Density	115	pcf
Rebar Strength, f_y =	60000	psi

Individual Column Footing

Total Column Load =	26	kips
Size required =	17.3	sq. feet
Try	4.16	foot square
Use	6	foot square

Total Column Load =	0.72	ksf
+ Additional Load =		
Floor slab =	0.08	ksf
Footing =	0.30	ksf
- Surcharge load due to displaced soil		
Floor slab =	0.06	ksf
Footing =	0.23	ksf

NET FOOTING LOAD = 0.81 ksf, < allowable, ergo OK

McPHERSON DESIGN GROUP p.c.
STRUCTURAL ENGINEERS
Structural Engineers with Practical Solutions
office 757.965.2000 • fax 757.965.2001 • 6371 Center Drive • Suite 100 • Norfolk, VA 23502 • www.McPhersonDesignGroup.com

Project:	Hampton Armory	Sht	of	By	Date: 4-Jun-10
Hampton, VA		Comm	10125	Ck:	Date:

Structural Data

P_u = 40.3 kips
As_req'd =
Net factored Soil Pressure 1.12 ksf

Check depth required for shear at d/2 from face of wall

V_u = 3.42 kips

v_c =4 x V f'c(0.85) = 201 psi
v_u = 7 psi
d_min = 0.12 inches < footing depth-3 inches -- ergo OK

Check concrete bearing strength -

B_u = 299.88 kips <=== OK, no dowels req'd for bearing
$A_{s\ req'd}$ = -4.33 in^2 (if negative, no dowels are required)

Steel required at face of column -

M_u = 23.88 ft-kips = 286.58 in-kips

f'c = 3500 psi
fy = 60000 psi

rho_{min} not applicable to slabs

b = 72 in
d = 21 in
h = 24 in

R_u_req'd= 10.03 psi
m= 20.17
$rho_{flexure}$ = 0.0002
(if you get #NUM! error message here, try a thicker footing)
rho_{temp} = 0.0018 in^2

McPHERSON DESIGN GROUP p.c.
STRUCTURAL ENGINEERS
Structural Engineers with Practical Solutions
office 757.965.2000 • fax 757.965.2001 • 6371 Center Drive • Suite 100 • Norfolk, VA 23502 • www.McPhersonDesignGroup.com

Project:	Hampton Armory	Sht	of	By	Date: 4-Jun-10
Hampton, VA		Comm		10125 Ck:	Date:

Reinforcing :

As $_{flexure}$= 0.25 in^2 each way, bottom

As $_{temp}$= 2.72 in^2 each way, total

width available= 65 in

		spacing
25	-#3 bars	2.7 in
14	-#4 bars	5.0 in
9	-#5 bars	8.1 in
7	-#6 bars	10.8 in
5	-#7 bars	16.3 in
4	-#8 bars	21.7 in
3	-#9 bars	32.5 in

Bar Size	Diameter (in)	Area in^2
3	0.375	0.11
4	0.5	0.2
5	0.625	0.31
6	0.75	0.44
7	0.875	0.6
8	1	0.79
9	1.128	1

Check development length for chosen bar size against width of footing

Check development length for chosen dowel against depth into footing

McPHERSON DESIGN GROUP p.c.
STRUCTURAL ENGINEERS
Structural Engineers with Practical Solutions
office 757.965.2000 • fax 757.965.2001 • 6371 Center Drive • Suite 100 • Norfolk, VA 23502 • www.McPhersonDesignGroup.com

Project:	Hampton Armory	Sht	of	By	Date:	4-Jun-10
Hampton, VA		Comm	10125	Ck:	Date:	

Footing Design General Data
Footing supporting steel column

for Columns of Side Girder

Column Loads

DL =	6.5 kips	
LL =	6.5 kips	
Bearing capacity =	1.5 ksf	
Concrete strength, f'c =	3500	psi
Column size	8	inches square
Baseplate size	12	inches square
Floor slab thickness	6	inches
Column footing thickness	24	inches
Soil Density	115	pcf
Rebar Strength, f_y =	60000	psi

Individual Column Footing

Total Column Load =	13	kips
Size required =	8.7	sq. feet
Try	2.94	foot square
Use	3.5	foot square

Total Column Load =	1.06	ksf
+ Additional Load =		
Floor slab =	0.08	ksf
Footing =	0.30	ksf
- Surcharge load due to displaced soil		
Floor slab =	0.06	ksf
Footing =	0.23	ksf

NET FOOTING LOAD = 1.15 ksf, < allowable, ergo OK

McPHERSON DESIGN GROUP p.c.
STRUCTURAL ENGINEERS
Structural Engineers with Practical Solutions
office 757.965.2000 • fax 757.965.2001 • 6371 Center Drive • Suite 100 • Norfolk, VA 23502 • www.McPhersonDesignGroup.com

Project:	Hampton Armory	Sht	of	By	Date: 4-Jun-10
Hampton, VA		Comm	10125	Ck:	Date:

Structural Data

P_u = 20.15 kips
As_req'd =
Net factored Soil Pressure 1.64 ksf

Check depth required for shear at d/2 from face of wall

V_u = -1.14 kips

v_c =4 x √f'c(0.85) = 201 psi
v_u = -2 psi
d_min = -0.04 inches < footing depth-3 inches -- ergo OK

Check concrete bearing strength -

B_u = 299.88 kips <=== OK, no dowels req'd for bearing
$A_{s\ req'd}$ = -4.66 in^2 (if negative, no dowels are required)

Steel required at face of column -

M_u = 5.78 ft-kips = 69.33 in-kips

f'c = 3500 psi
fy = 60000 psi

rho_{min} not applicable to slabs

b = 42 in
d = 21 in
h = 24 in

R_u_req'd= 4.16 psi
m= 20.17
$rho_{flexure}$ = 0.0001
(if you get #NUM! error message here, try a thicker footing)
rho_{temp} = 0.0018 in^2

McPHERSON DESIGN GROUP p.c.
STRUCTURAL ENGINEERS
Structural Engineers with Practical Solutions
office 757.965.2000 • fax 757.965.2001 • 6371 Center Drive • Suite 100 • Norfolk, VA 23502 • www.McPhersonDesignGroup.com

Project: Hampton Armory Hampton, VA	Sht Comm	of	By 10125 Ck:	Date: Date:	4-Jun-10

Reinforcing :

$As_{flexure}$= 0.06 in^2 each way, bottom

As_{temp}= 1.59 in^2 each way, total

width available= 35 in

		spacing
15	-#3 bars	2.5 in
8	-#4 bars	5.0 in
6	-#5 bars	7.0 in
4	-#6 bars	11.7 in
3	-#7 bars	17.5 in
3	-#8 bars	17.5 in
2	-#9 bars	35.0 in

Bar Size	Diameter (in)	Area in^2
3	0.375	0.11
4	0.5	0.2
5	0.625	0.31
6	0.75	0.44
7	0.875	0.6
8	1	0.79
9	1.128	1

Check development length for chosen bar size against width of footing

Check development length for chosen dowel against depth into footing

Floor Joist Span Tables

Allowable Floor Joist Span Table Notes

1. Web punchouts were not considered for shear or web crippling. Shear and web crippling reduction factors required for web punchouts, per ICBO Acceptance Criteria AC46, Appendix B.
2. Spans are based on continuous lateral support of the compression flange.
3. For two equal spans, the listed span is the distance from either end support to the center support. Joists must be continuous over the center support.
4. Web crippling capacity is based on a 3.5 inch bearing length at end and interior supports.
5. Joists must be braced against rotation at all supports by track or blocking.
6. Joist spans are based on 50 ksi for the 54, 68, and 97 mil thicknesses, and 33 ksi for thinner members.
7. Total load deflection = L/240. Live load as noted.
8. Live load has been checked for unbalanced load conditions.

Bridging Recommendations

Floor joist bridging may be spaced as follows, except where member design requires or will accommodate an alternate spacing.

Span (ft)	Minimum Number of Rows
up to 14 ft.	1 row at mid-span
14 ft. to 20 ft.	2 rows at ⅓points
20 ft. to 26 ft.	3 rows at ¼points

10 psf Dead Load and 20 psf Live Load

Member	Live Load Deflection L/360						Live Load Deflection L/480					
	Single Span Spacing (in) o.c.			Two Equal Spans Spacing (in) o.c.			Single Span Spacing (in) o.c.			Two Equal Spans Spacing (in) o.c.		
	12	16	24	12	16	24	12	16	24	12	16	24
600S162-33	15' 9"	13' 9" e	11' 3" e	15' 11" i	13' 9" i	11' 3" a	14' 3"	13' 0" e	11' 3" e	15' 11" i	13' 9" i	11' 3" a
600S200-33	16' 5" e	14' 3" e	11' 7" e	16' 5" i	14' 3" i	11' 6" a	14' 11"	13' 7" e	11' 7" e	16' 5" i	14' 3" i	11' 6" a
600S162-43	17' 2"	15' 7"	13' 7"	19' 3" i	16' 8" i	13' 7" i	15' 7"	14' 2"	12' 4"	17' 6" i	15' 10" i	13' 7" i
600S200-43	18' 0"	16' 4"	13' 10"	19' 6" i	16' 11" i	13' 10" i	16' 4"	14' 10"	13' 0"	18' 4" i	16' 8" i	13' 10" i
600S250-43	18' 10"	17' 1"	14' 2"	20' 0" i	17' 4" i	14' 2" i	17' 1"	15' 7"	13' 7"	19' 3" i	17' 4" i	14' 2" i
600S162-54	18' 5"	16' 8"	14' 7"	20' 8"	18' 9" i	16' 4" i	16' 8"	15' 2"	13' 3"	18' 9"	17' 0"	14' 10" i
600S200-54	19' 4"	17' 7"	15' 4"	21' 8"	19' 8" i	17' 3" i	17' 7"	15' 11"	13' 11"	19' 8"	17' 11"	15' 8" i
600S250-54	20' 2"	18' 3"	16' 0"	22' 7"	20' 7" i	17' 11" i	18' 3"	16' 7"	14' 6"	20' 7"	18' 8"	16' 4" i
600S162-68	19' 8"	17' 11"	15' 8"	22' 2"	20' 1"	17' 7"	17' 11"	16' 3"	14' 2"	20' 1"	18' 3"	15' 11"
600S200-68	20' 9"	18' 10"	16' 5"	23' 3"	21' 2"	18' 6"	18' 10"	17' 1"	14' 11"	21' 2"	19' 3"	16' 9"
600S250-68	21' 9"	19' 9"	17' 3"	24' 5"	22' 2"	19' 4" i	19' 9"	17' 11"	15' 8"	22' 2"	20' 2"	17' 7"
600S162-97	21' 10"	19' 10"	17' 4"	24' 6"	22' 3"	19' 6"	19' 10"	18' 0"	15' 9"	22' 3"	20' 3"	17' 8"
600S200-97	23' 0"	20' 11"	18' 3"	25' 10"	23' 6"	20' 6"	20' 11"	19' 0"	16' 7"	23' 6"	21' 4"	18' 8"
600S250-97	24' 2"	21' 11"	19' 2"	27' 2"	24' 8"	21' 6"	21' 11"	19' 11"	17' 5"	24' 8"	22' 5"	19' 7"
800S162-33	18' 2" e	15' 9" e	12' 10" e	17' 8" a	14' 5" a	10' 8" a	18' 0" e	15' 9" e	12' 10" e	17' 8" a	14' 5" a	10' 8" a
800S200-33	18' 10" e	16' 4" e	13' 4" e	18' 1" a	14' 9" a	10' 10" a	18' 10" e	16' 4" e	13' 4" e	18' 1" a	14' 9" a	10' 10" a
800S162-43	21' 7"	19' 6"	15' 11" e	22' 6" i	19' 6" i	15' 11" i	19' 7"	17' 10"	15' 7" e	22' 0" i	19' 6" i	15' 11" i
800S200-43	22' 7"	20' 6" e	16' 10" e	23' 9" i	20' 7" i	16' 10" i	20' 6"	18' 8"	16' 3" e	23' 0" i	20' 7" i	16' 10" i
800S250-43	23' 7"	20' 9" e	16' 11" e	24' 0" i	20' 9" i	16' 11" i	21' 5"	19' 5"	16' 11" e	24' 0" i	20' 9" i	16' 11" i
800S162-54	23' 2"	21' 1"	18' 5"	26' 0" i	23' 8" i	20' 8" i	21' 1"	19' 2"	16' 9"	23' 8"	21' 6" i	18' 9" i
800S200-54	24' 3"	22' 1"	19' 3"	27' 3" i	24' 9" i	21' 7" i	22' 1"	20' 0"	17' 6"	24' 9"	22' 6" i	19' 8" i
800S250-54	25' 3"	22' 11"	20' 0"	28' 4" i	25' 9" i	22' 6" i	22' 11"	20' 10"	18' 2"	25' 9"	23' 4" i	20' 5" i
800S162-68	24' 11"	22' 7"	19' 9"	27' 11"	25' 5"	22' 2" i	22' 7"	20' 6"	17' 11"	25' 5"	23' 1"	20' 2"
800S200-68	26' 1"	23' 8"	20' 8"	29' 3"	26' 7"	23' 3" i	23' 8"	21' 6"	18' 9"	26' 7"	24' 2"	21' 1"
800S250-68	27' 3"	24' 9"	21' 7"	30' 7"	27' 9" i	24' 3" i	24' 9"	22' 5"	19' 7"	27' 9"	25' 3"	22' 0" i
800S162-97	27' 8"	25' 1"	21' 11"	31' 1"	28' 2"	24' 8"	25' 1"	22' 10"	19' 11"	28' 2"	25' 7"	22' 5"
800S200-97	29' 0"	26' 4"	23' 0"	32' 7"	29' 7"	25' 10"	26' 4"	23' 11"	20' 11"	29' 7"	26' 10"	23' 6"
800S250-97	30' 4"	27' 6"	24' 1"	34' 0"	30' 11"	27' 0"	27' 6"	25' 0"	21' 10"	30' 11"	28' 1"	24' 6"
1000S162-43	24' 11" e	21' 6" e	17' 7" e	24' 11" a	21' 6" a	16' 6" a	23' 7" e	21' 5" e	17' 7" e	24' 11" a	21' 6" a	16' 6" a
1000S200-43	26' 4" e	22' 9" e	18' 7" e	26' 4" a	22' 8" a	17' 0" a	24' 7" e	22' 4" e	18' 7" e	26' 4" a	22' 8" a	17' 0" a
1000S250-43	26' 7" e	23' 0" e	18' 10" e	26' 7" a	22' 10" a	17' 1" a	25' 6" e	23' 0" e	18' 10" e	26' 7" a	22' 10" a	17' 1" a
1000S162-54	27' 10"	25' 4"	22' 1"	31' 4" i	28' 5" i	23' 10" i	25' 4"	23' 0"	20' 1"	28' 5" i	25' 10" i	22' 7" i
1000S200-54	29' 1"	26' 5"	23' 1"	32' 8" i	29' 8" i	24' 6" i	26' 5"	24' 0"	20' 11"	29' 8" i	26' 11" i	23' 6" i
1000S250-54	30' 2"	27' 5"	24' 0"	33' 11" i	30' 7" i	25' 0" i	27' 5"	24' 11"	21' 9"	30' 10" i	28' 0" i	24' 5" i
1000S162-68	29' 11"	27' 2"	23' 9"	33' 7"	30' 6" i	26' 8" i	27' 2"	24' 8"	21' 7"	30' 6"	27' 9"	24' 3" i
1000S200-68	31' 3"	28' 4"	24' 9"	35' 1"	31' 10" i	27' 10" i	28' 4"	25' 9"	22' 6"	31' 10"	28' 11"	25' 3" i
1000S250-68	32' 6"	29' 6"	25' 9"	36' 6" i	33' 2" i	28' 11" i	29' 6"	26' 10"	23' 5"	33' 2"	30' 1" i	26' 4" i
1000S162-97	33' 4"	30' 3"	26' 5"	37' 5"	34' 0"	29' 8"	30' 3"	27' 6"	24' 0"	34' 0"	30' 10"	26' 11"
1000S200-97	34' 9"	31' 7"	27' 7"	39' 1"	35' 6"	31' 0"	31' 7"	28' 9"	25' 1"	35' 6"	32' 3"	28' 2"
1000S250-97	36' 3"	32' 11"	28' 9"	40' 8"	36' 11"	32' 3"	32' 11"	29' 11"	26' 1"	36' 11"	33' 7"	29' 4"
1200S162-54	32' 6" e	29' 6" e	25' 9" e	36' 6" a	31' 9" a	25' 5" a	29' 6" e	26' 10" e	23' 5" e	33' 2" a	30' 1" a	25' 5" a
1200S200-54	33' 9" e	30' 8" e	26' 8" e	37' 9" a	32' 8" a	25' 10" a	30' 8" e	27' 10" e	24' 4" e	34' 5" a	31' 3" a	25' 10" a
1200S250-54	35' 0" e	31' 9" e	27' 3" e	38' 7" a	33' 5" a	26' 2" a	31' 9" e	28' 11" e	25' 3" e	35' 8" a	32' 5" a	26' 2" a
1200S162-68	34' 11"	31' 8"	27' 8"	39' 2" i	35' 7" i	31' 1" i	31' 8"	28' 10"	25' 2"	35' 7"	32' 4" i	28' 3" i
1200S200-68	36' 3"	33' 0"	28' 10"	40' 9" i	37' 0" i	32' 4" i	33' 0"	29' 11"	26' 2"	37' 0"	33' 8" i	29' 4" i
1200S250-68	37' 8"	34' 2"	29' 10"	42' 3" i	38' 5" i	32' 4" i	34' 2"	31' 1"	27' 2"	38' 5" i	34' 11" i	30' 6" i
1200S162-97	38' 10"	35' 4"	30' 10"	43' 8"	39' 8"	34' 8"	35' 4"	32' 1"	28' 0"	39' 8"	36' 0"	31' 6"
1200S200-97	40' 6"	36' 9"	32' 1"	45' 5"	41' 3"	36' 1"	36' 9"	33' 5"	29' 2"	41' 3"	37' 6"	32' 9"
1200S250-97	42' 0"	38' 2"	33' 4"	47' 2"	42' 10"	37' 5" i	38' 2"	34' 8"	30' 3"	42' 10"	38' 11"	34' 0"

" e " Requires web stiffeners at end supports " i " Requires web stiffeners at interior supports " a " Requires web stiffeners at all supports

FACILITY CONDITION ASSESSMENT

For The Old

NATIONAL GUARD ARMORY BUILDING

504 N. King Street

CITY OF HAMPTON
DEPARTMENT OF PARKS AND RECREATION

HAMPTON, VIRGINIA

Prepared By:

THE TAF GROUP

Architectural Services

100 LANDMARK SQUARE
VIRGINIA BEACH, VIRGINIA 23452
(757) 340-5055

COMMONWEALTH OF VIRGINIA
GEORGE M. NICHOLOS
No. 008102
6-18-04
ARCHITECT

June 18, 2004

TABLE OF CONTENTS

HAMPTON VIRGINIA

JUNE MCPARTLAND
DEPUTY DIRECTOR

Original - only copy
Return to.

DEPARTMENT OF ECONOMIC DEVELOPMENT
One Franklin Street, Suite 600 ▪ Hampton, Virginia 23669-3578
Phone: 757-728-5144 ▪ Toll Free: 1-800-555-3930 ▪ Fax: 757-727-6811
E-mail: jmcpartland@hampton.gov ▪ Web: www.hamptonva.biz

THE TAF GROUP

A. INTRODUCTION

The TAF Group submitted a Professional Services Proposal to the City of Hampton, Department of Parks and Recreation to provide a facility condition assessment of the Old National Guard Armory Building. The proposal offered services for the preparation of a condition assessment investigation of the existing facility located at 504 N. King Street **(See photograph #1)** with particular attention paid to the following items:

- Aesthetic appearance of the building.
- Condition of building components and review of programming issues associated with the proposed use of the building as either an arts center with working artist's studio spaces with administrative support and meeting rooms, or for use by a performing arts group.
- Condition of the doors and windows.
- Condition of the interior building finishes.
- Condition and assessment of insulating properties of the existing building.
- Condition of interior walls, rooms, furnishings, stage, stairs, basement and balcony.
- Condition of the exterior walls.
- Condition of the interior lighting systems.
- Condition of heating, ventilating, and air conditioning.
- Condition of plumbing.
- Condition of the structure.
- Condition of the roof and parapet walls.
- Condition of the landscaping and fencing around the building.
- Condition of the site lighting.
- Adequacy of the parking and drives around the building exterior.
- Adequacy of the signage systems.
- Accessibility components and requirements for compliance with local and federal American with Disabilities Act (ADA).
- Perimeter security.
- Detailed investigation of the existing plumbing, mechanical, and electrical system associated with the building.
- Conformance to and requirements necessary to comply with applicable Building Code requirements.

- Identification of asbestos, lead, mercury or PCB (polychlorolbiphenyl) containing materials.

The purpose of the investigation is to document the existing condition of the site and building and to provide recommendations for the improvement and renovation of the existing facility. The two primary uses of the facility under preliminary consideration are for use as either an arts center with working artist's studio spaces with administrative support and meeting rooms, or for use by a performing arts group, also with supporting dressing rooms and office spaces. In addition to a facility condition report, the intent of this report is to also provide preliminary design recommendations as well as to provide associated estimated construction costs. The report is designed to provide the City with an objective analysis of the status of the existing facility and the associated fiscal impact inherent with necessary and required improvements to the facility dependant on the intended use of the renovated facility.

The following report provides a general description of the facility and incorporates the use of itemized tables, which list various improvement and renovation recommendations with associated construction costs. The focus of the report addresses minimum actions deemed necessary to correct existing code violations, actions necessary to comply with applicable Building and Handicap Accessibility Code requirements encompassing architectural, mechanical, plumbing and electrical concerns, and necessary improvements to facilitate the health, safety, and welfare of users and patrons to the facility. Thus primary focus of the report is on the identification of basic or minimum measures and associated costs necessary to inhabit the existing facility as an arts center with working artist studio spaces or as a center for performing arts.

Note, the report does not include detailed information regarding items such stage lighting, spot light equipment, sound systems, stage proscenium treatments, or facilitation for onsite food preparation as these items are unique to particular applications and are sized at the time of project design based on a specific design program. However, optional costs have been provided as have the costs associated with sizing electrical and mechanical systems with the foresight of support for these anticipated needs and their associated electrical and mechanical demand needs.

B. EXISTING CONDITIONS / RECOMMENDATIONS

ARCHITECTURAL - SITE EXISTING CONDITIONS / RECOMMENDATIONS:

General Description:

The existing facility was constructed in 1936 and has served until recent years as a National Guard Armory. Currently the facility is in general disrepair and is used for storage by various City of Hampton departments and agencies. The individual rooms and spaces throughout the building are locked. Computers, office equipment and office furniture are stored in subdivided spaces in the main auditorium space by wood stud and wire mesh partition walls. Thus the appearance and condition of the building is one in limbo between disrepair and abandonment. None of the interior spaces appear to be actively inhabited.

The existing building is constructed with a combination of brick masonry walls, wood floors and interior partitions, wood roof decking, wood roof joists at the forward and rear portions of the building and steel roof trusses in the center portion of the building. No original construction drawings of the building exist however a small "not to scale" fire egress floor plan was discovered in one of the spaces **(See appendix B)**. Room names references to are generally taken from this diagram.

The building was originally designed to serve as a National Guard Armory and contains approximately 11,870 square feet. The building is basically divided into three sections. The forward two-story portion of the building contains approximately 3,192 square feet, the rear two-story portion of the building contains approximately 2,448 square feet, and the center one-story high-bay auditorium space contains approximately 6,230 square feet. All three portions of the building are constructed over a crawlspace. A complete survey of the crawlspace and floor structure was not conducted at the time of our site inspection as the crawlspace was observed to be contaminated with asbestos from deteriorating asbestos containing pipe lading insulation **(See photographs #2 and #3)**. However we were able to identify from a floor access panel in the center of the main entrance corridor a few locations in the forward portion of the crawl space which appear to recently have had the wooden floor structure shored up with wood beams supported by new masonry piers. The remedial crawlspace shoring structures appear to have been constructed to reduce existing excessive floor sagging on the north side of the main entrance corridor. Although we were unable to visually inspect the entire crawlspace it is reasonable to assume that there are other localized areas of similar sagging floor spans in need of similar reinforcement support.

The first floor forward section of the building contains circulation corridors that provide access to the rooms and adjacent main auditorium space. The existing floor tile is in poor condition and contains asbestos[1] and thus should be removed and replaced. The plaster walls and ceilings are in good condition, however they need to be painted. The water cooler at the main entrance has exceeded it expected service life and does not comply with handicap accessibility requirements and thus must be replaced.

Both the Men's and Women's restrooms are in very poor condition characterized by deteriorated asbestos containing floor tile, water damaged wood wall paneling, water damaged wall plaster **(See photograph #4)**, and cracking / peeling ceiling plaster. The width of the access corridors to the both restrooms as well as the door openings and door hardware do not comply with handicap code requirements. The clearance around plumbing fixtures, the height of fixtures, controls and switches do not comply with handicap code requirements. No handicap stalls, mirrors, grab bars, insulation on drain lines and hot water supply lines are provided in either restroom. As the existing restrooms are in poor condition and in almost an abandoned state, and as the existing restrooms are not big enough to accommodate the size and number of fixtures required by the plumbing code and handicap code it will thus be necessary to completely demolish and replace the existing restrooms.

The floor tile in the Orderly Room and adjacent Storage Room located at the southwest corner of the building is in poor condition and contains asbestos and thus should be removed and replaced. Wood wall paneling in both of the rooms is cracked and nicked at numerous locations and plaster portions of the wall surfaces were observed to have numerous areas of water damage thus requiring extensive wall repairs and wall finish replacement. An unsightly surface mounted metal patch panel was used in the center of the ceiling to patch a hole **(See photograph #5)**. The veneer plaster ceiling was is in poor condition characterized by water damage at several locations and is near collapse and should be replaced. Concerns associated with breaches of internal wall and ceiling finishes is the probability and likelihood of the ongoing release of asbestos fibers into the air. While it appears that much of the asbestos containing pipe insulation has already been abated at exposed locations, as observed in the crawlspace, it is quite likely that asbestos containing pipe insulation was not abated in concealed spaces. Thus as the insulation has continued to deteriorate, fibers formerly encased within concealed spaces in the building are

[1] Asbestos fibers were identified in the floor tile as part of this investigation. Refer to appendix C for asbestos and lead based paint survey data.

capable of escaping into habitable spaces from breaches in the ceiling and wall finishes thereby exposing inhabitants to asbestos fibers and cross contaminating interior spaces.

The wood substrate of the painted floor in the Commander's Office located on the north side of the Women's restroom is in good condition, however the paint finish is in poor condition characterized by excessive scuffing from equipment storage. The painted veneer plaster ceiling is also in good condition while the wood wall paneling and plaster wall finish is in fair condition with some repair required.

The Training Room floor at the northeast corner of the first floor is vinyl. The vinyl flooring is in poor condition and contains asbestos and thus should be removed. The wood wall paneling and plaster wall surfaces are in poor condition characterized by severe water damage and mold **(See photograph #6)**. The veneer plaster ceiling is in poor condition, shows evidence of water damage and is near collapse in the center portion of the room and thus is in need of replacement **(See photograph #7)**.

Both wood stairs in the front portion of the building are in good condition, however the wall and ceiling finishes need to be painted. Stair handrails and tread grips will also need to be added to comply with handicap accessibility requirements.

The second floor of the front portion of the building contains a classroom, recruiting office, toilet, closet, office and balcony that overlooks and overhangs the west end of the auditorium. The balcony railing is fabricated with steel pipe tubes which has had painted plywood attached on the auditorium side to act as a backboard to a basketball goal **(See photographs #8 and #9)**. Several sections of plywood are loose and the plywood barrier does extend the full length of the guardrail. The openings in the existing guardrail exceed the opening space allowed by Code and the horizontal members present a climbing hazard, which is also not allowed by the Building Code. There is no toe guard to prevent objects from rolling off the balcony onto people below. As the guardrail and plywood barrier do not comply with the Building Code, the entire existing guardrail assembly should be removed and replaced with a new guardrail.

We were unable to enter the Recruiting Room located in the center portion of the second floor as it is full of stored boxes, however the veneer plaster walls and ceilings were observed to have water damage and be in need of repair. It is also recommended that the quantity of materials stored in this room be reduced to lower the point load weight on the building structure at that location. Severe water damage was observed on the plaster on metal lath wall finish, floors, and door frames in the adjacent corridors on either side of the Recruiting Room and are in need of

repair (**See photographs #10, #11, #12, and #13**). In addition several poorly constructed wood stud partitions along corridors and auditorium balcony have been damaged (**See photograph #14**).

While the floor condition in the FDC Room located at the southwest corner of the building is in fair condition need refinishing, the veneer plaster walls and ceilings are in poor condition, characterized by severe water damage and in need of extensive repair (**See photographs #15 and #16**). The ceiling and roof access hatch over the corridor adjacent to the FDC Room has also been severely water damaged and is in need of repairs (**See photograph #17**). The ceiling, walls, floor, and plumbing fixtures in the small restroom located adjacent to the FDC Room are in very poor condition as the room appears to have been abandoned. Additionally none of the plumbing fixtures, controls, clearances, door width, and door width into the FDC Room are in compliance with handicap accessibility requirements.

The center auditorium space is constructed with a high bay exposed steel truss structure supporting an exposed wood plank deck and slate roof (**See photograph #18 and #19**). The wood plank floor is in relatively good condition and is finished and marked as a basketball court. The floor however needs to be refinished and patched at some localized areas. The high space with large windows on each side is very conducive to an adaptive reuse as working artist studios. However, as with the rest of the building, while the wood roof, steel trusses, and brick masonry walls are in good condition the walls, roof and floor are not insulated and thus will not meet energy code imposed requirements without increasing the insulation value in the space. The large windows are also in fair to good condition, however they are non thermally broken steel frame window units with single paned glass and thus are extremely energy inefficient. In many instances the steel windows are racked such that the sashes do not fully close. Many window units also contain numerous broken glass lites, severely deteriorated caulking, and all of the window units are coated with lead paint[2] which presents a hazard when disturbed and an increased cost if repainted, and thus the window units should be replaced. The raised stage with proscenium at the east end of the auditorium has been filled in with drywall construction leaving the exposed proscenium visible in the auditorium space. The stage and back stage area have been in-filled with poorly constructed "self-help[3]" wood stud walls, plywood floors and wood stairs which are not in compliance with the Building Code and thus should be removed. The question whether the stage should be reopened depends on the intended building use. However, if the stage is reopened, building officials will

[2] Lead containing paint was identified on the existing steel window units as part of this investigation. Refer to appendix C for asbestos and lead based paint survey data.

impose stricter building code requirements on the facility based on higher anticipated occupancy loads which result in higher costs for plumbing, mechanical, fire protection, and electrical loads to accommodate the increased occupant loads. The itemized tables in this report further address the impact of the stage and building occupancy classification.

The open latrine / shower room located at the southeast corner of the building is in very poor condition and appears to have been abandoned. The plumbing fixtures, wall, ceiling and floor finishes are in poor condition and are characterized by water damage, cracking, and peeling paint **(See photographs #20, #21 and #22)**. None of the fixtures, controls, clearances and door access into the room are in compliance with the handicap accessibility code.

The room identified as the Howitzer Section Room and the wood access stair into the room located at the southeast corner of the building are in very poor condition. The wood access stair has deteriorated severely from water damage, has broken treads and weakened runners and thus needs to be replaced **(See photograph #23)**. The roof access hatch, access passage, surrounding ceiling, and adjacent wood floor have been severely water damaged **(See photograph #24)**. One window in the room has been severely damaged, the cabinetry in the room is in very poor condition as is the plaster and wood paneling walls **(See photograph #25 and #26)**.

The back stage area wood partitions and stairs are in poor condition and should be removed. The wood stud and plywood stair guardrails are unsafe, do not meet code lateral load requirements and thus should be removed and replaced **(See photographs #27 and #28)**. Severe water damage was also observed on the rear or east masonry wall behind the stage **(See photographs #29 and #30)**. The spaces labeled as Commo Room[4], Mess Storage and Supply Storage and the circular access stair are all in poor condition characterized by water damage, peeling paint, broken doors, and windows. The access stairs are in poor condition and need to be replaced. The access clearances, doors, and stairs also do not comply with handicapped accessibility requirements and thus must be reconstructed. It should also be noted that if these spaces along with the Howitzer room are used for purposes other than those with a minimal occupant load, that an exterior second means of egress will be required as these spaces are currently dead ends and are considered a life safety concern. The Motor Shop located on the first floor at the northeast corner of the building is currently used for the storage of art supplies. The concrete floor is in good condition, but the walls

[3] Many military commands are provided with funds to purchase materials to pursue construction improvement projects within their own command. Self help projects typically do not include the use of professional architects, engineers, or contractors and thus frequently result in substandard construction.

[4] The space labeled as Commo Room is located at the northeast corner of the second floor.

and ceiling are in poor condition characterized by water damage and peeling paint **(See photograph #31)**.

The kitchen walls and ceiling are in fair condition. However the painted concrete floor is in poor condition. Cabinets and shelves, which are constructed out of painted lumber, are in fair condition. The swinging stainless steel kitchen door is in poor condition. The door width and the width of the small access corridor into the kitchen do not comply with either Building Code or handicap accessibility requirements and thus must be reconstructed.

An unused basement area is located under the rear portion of the building. There is only one point of access from a stair in the backstage area and thus limits the use of the basement to storage. The basement is constructed with concrete walls, floor and ceilings. Several small rooms, used for the storage of weapons, are interconnected from a central point at the base of the stairs. The rooms are currently empty. The walls and floors are clean showing no evidence of water leakage. There is also no anecdotal evidence of flooding, however during periods of excessive rain or periods accompanied by a high water table it is possible that flooding may occur in the basement and thus should be protected by a sump pump.

On the exterior of the building, while the building is constructed with some excellent brick masonry patterns and details, the building exhibits extensive masonry deterioration in the form of cracks and mortar failure due to a combination of poor or no maintenance, and deterioration natural to the type of construction. The exterior heavy wood man doors and roll up doors used throughout the facility are in very poor condition characterized by rotting and splitting **(See photographs #32 and #33)**. The weight of the solid doors makes them difficult to operate and exceeds the maximum force allowed in the operation of a door. The door hardware on the exterior doors as with all of the interior doors is in very poor condition and does not comply with handicap accessibility requirements. The exterior doors are also constructed of wood planks and thus are not insulated resulting in energy inefficient doors that are not in code compliance and thus must be replaced. Several of the steel windows as previously mentioned, are damaged, coated with lead paint and are not insulated or thermally broken and thus are energy inefficient and should be replaced **(See photographs #34 and #35)**.

Extensive deterioration to the exterior masonry was observed primarily at the top or parapet portion of the wall and on either side of window heads **(See photographs #36, #37, #38 and #39)**. All cracks and severely deteriorated bricks and mortar joints must be repaired to prevent further deterioration to the structure, moisture intrusion, and prevent personal injury from falling bricks or localized collapsing of brick masonry. Additionally all rusted steel window and door lintels must be

cleaned and painted, severely rusted steel lintels replaced. The brick steps at the main entrance must be repaired to prevent further deterioration and eliminate the tripping hazard. The existing gutters and downspouts on the building are in very poor condition. Most sections of gutters have severely rusted or collapsed altogether **(See photographs #40 and #41)**. Several downspouts have collapsed allowing roof drainage to flow down the face of the brick thereby allowing the brick and mortar to become saturated and deteriorated from the freezing and thawing of absorbed water **(See photographs #42, #43, and #44)**. Severe brick deterioration on the chimney structure also needs to be repaired **(See photograph #45)**.

The existing building has no handicap accessible entrance and both rear stairs on either side of the backstage require handrails and guardrails be in code compliance and to prevent personal injury **(See photographs #46 and #47)**.

The existing roof is in fair condition, but in need of attention. The roof over the forward and rear portions of the building are flat with roof pitch for drainage built into the roof structure for drainage. The roof over these areas of the building are multi-ply built up roofs with an aluminum paint coating for protection from ultraviolet light. The roofs appear to be approximately 15 to 20 years old. The aluminum paint coating is severely worn **(See photograph #48)** which has allowed the roofs to deteriorate at an accelerated rate and appear to have an additional life expectancy of 5 to 7 years if properly maintained. Although the built up roof system is in fair condition, the roof hatches are rotten and near collapse and several areas of roof flashing must be repaired to prevent continued damage to the structure below **(See photographs #49, #50, #51, and #52)**. The large circular wood louvers at either end of the raised roof over the auditorium space are severely deteriorated and need to be replaced **(See photograph #53)**. In addition the entire run of wood rake at the edge of the raised roof over the auditorium is severely rotted, damaged and in need or replacement **(See photographs #54 and #55)**. Also, while the slate roof shingle roof over the auditorium is generally in good condition, several missing tiles need to be replaced and several loose tiles need to be firmly attached **(See photographs #56 and #57)**.

Although the grass on the site appears to have been semi-regularly mown, the site is somewhat overgrown with weeds and vines choking the perimeter fence **(See photograph #58)**. The perimeter fence is in fair to poor condition beginning to fall over at some locations. The site is also littered with sand, chunks of concrete, fence sections, fence gates and concrete pipe sections which need to collected and disposed **(See photograph #59)**. Additionally, there is no site lighting, and no paved surface parking and drives with handicapped accessible parking facilities walks and ramps into the building which will be required in a renovated facility.

General Recommendations:

The site around the entire building should be graded and paved to provide parking facilities. The parking should be provided on both sides of the building with a continuous drive around the building to facilitate vehicular circulation access by emergency vehicles. Parking lot lighting should be provided for security and the existing perimeter fence repaired, painted and fitted with new entry and exit gates. New curb cuts and ingress / egress drives will be required. A front and side handicap entrance must be provided with accessible paths to the street and on site handicap parking and handicap van parking spaces. A ramp with guardrails in compliance with accessibility requirements will be required both at the front and side of the building.

It is recommended that the use of the building be limited to a (B) Business Occupancy classification for working studio spaces and not an (A3) Assembly Occupancy for live performances as in our opinion an Assembly Occupancy is cost prohibitive requiring added electrical, mechanical, plumbing, fire protection costs. In addition, there is hardly enough available parking on site to accommodate the zoning code requirements for a live performance center.

To meet the requirements of (B) Business Occupancy it will be necessary to disable the stage and not hold large public gatherings within the building. It will be necessary to reconfigure the entire first and second floor of the forward portion of the building to facilitate the provision of adequately sized modern restroom facilities in compliance with the handicap code. This will require new toilet fixtures, toilet accessories and wall, ceiling and floor finishes.

It is recommended that the balcony be renovated as an observation platform allowing patrons and providing school groups an opportunity to look down and watch artists at work as well as provide a gallery of display area for changing exhibits or small receptions. We would also recommend that a small room or space in the front portion of the building to be used as a permanent neighborhood room with photograph montages of the building, historically placing it in the neighborhood and telling of its significance as part of the neighborhood and now its return in helping to revitalize the neighborhood. The auditorium space should be subdivided in variety of sizes for use as studio spaces. The stage proscenium should remain closed as if it remains open; the facility will be classified as an Assembly Occupancy building.

The existing backstage infill of walls, stairs and floor should be removed. The existing latrine / shower located at the northeast corner of the building should be abandoned as a latrine and renovated as a wet sink artists work area. The existing kitchen should be renovated into a common lunchroom canteen with an outdoor patio area for contemplation and discussion. No food

preparation should be provided and the kitchen should serve as no more than a warming kitchen with microwave units. The remaining spaces in the rear portion of the building should be used as storage and office support. The existing basement should be abandoned unless desired for storage.

To comply with energy code requirements it will be necessary to fur out the exterior wall surfaces to provide wall insulation and to conceal new electrical conduit and receptacles. It will also be necessary to provide floor insulation between the existing floor joists and between ceiling joists on the second floor between the second floor ceiling and underside of the roof the front and rear portions of the building. Due to the large expanses of windows and doors it will also be necessary to provide new insulated windows and doors that are also in compliance with handicap accessibility requirements. It is our opinion that the new windows and doors should selected to match as close as possible the existing aesthetics of the period to maintain the authenticity of the architectural style found in the building.

MECHANICAL EXISTING CONDITIONS / RECOMMENDATIONS:

General Description:

The Hampton Armory is an existing un-insulated two-story brick building, built in 1936. The main auditorium / drill floor and adjacent office spaces are currently being used for storage by various department and agencies in the City of Hampton.

A gas-fired hot water boiler located in the southeast corner of the building was designed to provide heat to the entire building. The existing heating system is original to the building, however the boiler does not appear to have been energized for quite some time. The building appears to be currently used for storage without central heat. A couple of electric space heaters were in use in the office located at the southwest corner of the building at the time of our investigation. Also, consistent with a building constructed in this era, is that there are no mechanical means for the provision of air conditioning in the building. Two circular wood louvers are located high over the center auditorium. One louver is located at each end of the auditorium to provide natural cross ventilation. Both louvers are in very poor condition and in need of replacement or removal depending of the configuration of the new HVAC[5] system.

[5] A construction industry acronym for heating, ventilating, and air conditioning system.

The gas-fired boiler has a 16" diameter boiler flue that connects directly to an unlined chimney also located at the southeast corner of the building. The flue is severely deteriorated and in need of extensive masonry repairs above the roofline. Four hydronic pumps, fitted with zone controls, are designed to distribute hot water from the boiler to baseboard mounted fin-tube radiation units located throughout the perimeter of the building, and to four large ceiling mounted unit heaters serving the central auditorium space. The boiler was observed to be in poor condition and is considered abandoned and beyond its expected service life. The baseboard radiation system is also damaged at numerous locations throughout the building and thus is deemed unusable. While portions of the visible interconnecting hydronic piping appears to be in fair to good condition, we were not able to determine the condition of the interior of the piping or the extent of internal scale buildup. However, due to the age and state of disrepair of the interconnected system, it is our opinion that the functionality of the hydronic piping is beyond its expected service life. In addition, no insulation was observed on any supply or return hot water heating piping. The visible insulation that at one time encased the hot water hydronic piping most likely contained asbestos, as does the pipe insulation, (lading), still present in the crawlspace and thus was most likely removed as part of a previous asbestos abatement effort. However, while no destructive testing was performed as part of this investigation, it is highly expected that portions of the hydronic piping concealed by the structure are still insulated by asbestos containing pipe insulation and will require abatement if disturbed by any new construction and included in a facility Operation & Maintenance, (O&M), program identifying and alerting building users to the presence of the asbestos containing pipe insulation.

A kitchen, "galley," is located on the ground floor at the rear of the building. The kitchen appears to still be in limited use. The kitchen contains preparation tables, shelves, cupboard closet and gas range. The gas range has 10 burners and is in fair condition, however due to its age is approaching the end of its expected service life. A commercial type kitchen hood is installed over the gas range equipment and a sidewall exhaust fan manufactured by Fasco exhausts the hood to the exterior. Make-up air for the hood exhaust system is introduced into the Kitchen through an 18" x 18" louver mounted on the kitchen door. There are no existing means to filter or heat the outside make up air as it enters through the door mounted louver. Also, the kitchen hood assembly does not have a fire suppression hood system, or emergency gas shut-off and thus is safety hazard and Code violation and thus must be corrected in a renovated facility. In addition, due to their age and condition, both the exhaust fan and kitchen should be replaced as they are considered to have exceeded their expected service life.

Common to buildings constructed during the 1930's, the existing building has no mechanical ventilation in any of the spaces including the toilet rooms, which are not exhausted. The lack of a mechanical ventilation system is an existing Mechanical Code violation and must be corrected in a renovated facility.

General Recommendations:

Due to the age, state of disrepair and limited mechanical systems in the existing building, we recommend that the existing mechanical systems be completely replaced with a new heating, ventilating and air conditioning (HVAC) system. However it should be noted that the capacity and subsequent cost of a new HVAC system is dependent on the intended[6] use and Building Code occupancy classification and thus these factors associated with a new mechanical system cannot be established until the building classification has been determined and finalized.

If the building is classified as A-3, (Assembly Occupancy), the HVAC system in accordance with the Building Code must be designed for a maximum occupancy load of 791 people based on a total area of 11,870 square feet. However, if the building is classified as B, (Business Occupancy), and the maximum occupancy load is reduced to 120 people. A reduced occupancy load directly affects construction cost as a smaller HVAC system is required and reduces future operation and maintenance costs. However, even if the building is classified as a Business Occupancy, the local code officials may still see the potential for the mechanical requirements associated with an increased occupancy load if the main room, (auditorium), in the center of the building is configured to accommodate large crowds, continues to utilize the stage proscenium and is made open to the public for the purpose of public art exhibitions or large public gatherings. While subject to review, this requirement is at the discretion of the approving code official.

However, under either occupancy classification, the mechanical systems in any new or renovated facility must also be designed and comply with nationally recognized standards and code requirements as listed below:

- International Energy Conservation Code
- International Mechanical Code
- American Society of Heating Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 90.1-1999 Energy Standard for Buildings

[6] Requirements for a Business Occupancy as well as for an Assembly Occupancy are provided for comparison purposes although due to the limitations of the site, adaptive reuse o the facility as a Business Occupancy is recommended.

- American Society of Heating Refrigerating and Air-Conditioning Engineers (ASHRAE) 2003 Applications Handbook

Additionally, while a new HVAC system is required by the Building Code, a new HVAC mechanical system must also be designed in close concert with the design of new wall, floor and ceiling insulation improvements, as well as thermal improvements in doors and window units necessary for the overall renovated facility to comply with the International Energy Conservation Code. The International Energy Conservation Code requires that the thermal value of the individual building components, (walls, ceilings, floors, doors, and windows) when combined meet the thermal performance calculation requirements for the renovated building envelope. This requirement presents numerous expensive issues that must be dealt with in the renovation of a building constructed in an era prior to the energy concerns and requirements today. The existing building has no insulation in the walls, floors, or ceiling / attic, no thermally broken window units, no thermal paned glass, no insulated exterior doors, no roof insulation over the central auditorium space, no shading devices, (tinted or reflective glass), no high output efficiency lighting, or modern energy savings heating and cooling plant, all of which must be addressed in a renovated facility for compliance with the International Energy Conservation Code.

A new mechanical system would consist of a new gas-fired hot water boiler installed in the place of the old boiler to provide heat to the entire building. The boiler room will need to be cleaned, abated of hazardous materials as necessary and modernized to facilitate the new mechanical equipment. An air-cooled chiller would be located on the ground behind the facility and be enclosed with security fencing to protect the equipment from vandalism. The air-cooled chiller will provide and satisfy the cooling requirements for the entire building. Space within the facility must be designated to house a new air handling unit, pumps, a storage tank for chilled water and controls. Based on the existing configuration of the building, we recommend that the mechanical equipment should be located upstairs in a room behind and adjacent to the existing stage area.

Special Requirements for the Mechanical System Under an 'A-3' Assembly Building Occupancy Classification

This scenario describes the necessary provisions for the use of the building as an auditorium/performing arts center with the existing stage. An auditorium used for stage productions using stage lighting has the potential for generating significant electrical lighting loads and heating loads imposed upon the air conditioning system. The increased heat load would need to be counterbalanced with a larger HVAC system. In addition, the increased occupancy requirements associated with an A-3 Assembly Occupancy classification supporting live stage productions would

require greater amounts of outside air to be heated and cooled in order to satisfy ventilation requirements dictated by the building codes referenced. Thus, if the building were classified as A-3, this means that the capacity of the new heating and cooling system would need to be designed and sized to satisfy these additional internal loads. It would be necessary to increase in size and capacity the HVAC system to satisfy the increase in heating and cooling loads.

In addition, if a new commercial kitchen is to be incorporated into the building, it will be necessary to remove the existing kitchen hood assembly and provide a new kitchen hood assembly with a fire suppression system and make-up air fan with air filtration capabilities. A modernized kitchen capable of supporting food preparation on site would also require a new exhaust fan assembly.

Special Requirements for the Mechanical System under a 'B' Business Occupancy Classification

If the building is to be utilized as working artists' studios with adjoining administrative support, special localized exhaust requirements and fire rated separations may be required depending on specialized activities. Additional localized exhaust systems will be necessary to remove concentrated heat loads from kilns, or specific areas where spray painting, metalwork, air brushing, or other heat generating or air particulate generating activity is anticipated. There may also be special temperature/humidity criteria that must be satisfied, depending upon the type of painting activity anticipated in the studios and special environmental requirements for storage of artwork and materials.

If no commercial kitchen is to be incorporated into the 'B' Business Occupancy Classification, it is recommended that the existing kitchen be renovated for use as small canteen / lunchroom. No special exhaust requirements are required for a lunchroom as long as cooking is limited to microwave use.

ELECTRICAL EXISTING CONDITIONS / RECOMMENDATIONS:

General Description:

Electrical Service:

The existing building has three electrical services. Two electrical services are original from the time of construction and a third electrical service that appears to have been added recently. The two original services are both 120/240 volt single phase. Both are 200 amp services, which

have been tapped and thus are not in compliance with Electrical Code requirements. A separate smaller electrical service is designated for the emergency and exit lighting. The electrical services original to the building date back to 1936; the date of construction. The significance regarding the existing wiring dating back to the time of construction is that wiring installed before 1950 tends to disintegrate when disturbed, thus we recommend that all the wiring be replaced. The 200 amp service feeds 2 electrical panels: one that appears to date back to the time of construction, while the other appears to have been replaced in the 1950's and thus similarly should be replaced. At the time of our investigation one of the breakers tripped, which is indicative of the frailty of the existing electrical components. The new electrical service provided to the building is a 200 amp, 120/240 volt three phase high leg service load center. This component is not properly labeled for a high leg service and was not energized at the time of our inspection. The load center appeared to be approximately 20 plus years old and thus as with all of the other electrical services they are considered in need of replacement as they are beyond their expected service life.

Interior Lighting:

The existing interior building lighting is in very poor condition. A majority of the existing fluorescent lighting in the forward and rear portions of the building are broken and at many of the other light fixtures the ballasts appeared to be going bad. While the auditorium is well lit during the daylight hours with natural lighting filtering in from the large windows located on the side walls, the existing incandescent lighting in the auditorium space provides poor illumination at night as it is undersized and in poor condition. The existing building contains no emergency lighting and the emergency egress "exit" light fixtures are either non-existent or in poor condition and do not meet IESNA[7] nor NFPA Life Safety recommendations.

Site Lighting:

Existing site lighting consists of exterior wall mounted incandescent floodlights on the sides of the building. The existing incandescent floodlights are in poor condition and are an inefficient source of light and thus should be removed and replaced with new site lighting. Exterior wall mounted light fixtures located adjacent to doors were observed to be in either poor condition, damaged or missing altogether and thus should also be replaced.

Wiring and Receptacles:

The existing building wiring is old and in poor condition, thus we recommend that all of the electrical wiring, which also includes the telephone wiring, should be replaced. Existing electrical

receptacles are sparsely spaced and located on the walls such that they are not in compliance with handicapped barrier free requirements. Some electrical receptacles were observed to not be electrically grounded as required by the electrical code and thus are not in code compliance and should be replaced.

General Recommendations:

Electrical Service:

The current service is deemed inadequate to supply and support the electrical loads associated with new mechanical and electrical systems in a renovated facility. In addition, the current electrical service installations are deemed illegal installations, not in code compliance, in poor condition and present a dangerous safety condition. Thus we recommend that a new electrical service be installed sized to accommodate all future electrical loads.

Interior Lighting:

We recommend that new lighting be installed throughout the entire facility in accordance with NFPA, IESNA recommendations and ASHRAE[8] 90.1 requirements. We recommend that new suspended fluorescent lighting be used in the spaces located in the two-story forward and rear portions of the building and suspended low fluorescent low bay fixtures in the auditorium space area with either manual or automatic day-lighting control.

Site Lighting:

To improve security and promote safety around the building and site we recommend that new wall mounted metal halide wall packs be installed and directed to illuminate all areas around the building. We also recommend that new egress lighting be provided at all doors.

Wiring and Receptacles:

We recommend that all new communications and electrical power wiring be installed throughout the building. We also recommend that new electrical receptacles be installed for both systems in accordance with building code and handicap barrier free requirements.

Special Electrical System Requirements under a 'B' Business Occupancy Classification

Electrical Service:

[7] Illumination Engineering Society of North America.
[8] American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

In addition to the basic electrical requirements discussed, the electrical service for a Business Occupancy classified building would have to be also sized accommodate any high energy consumption source or special equipment such as kilns, arc-welders or furnaces that the artists might require.

Interior Lighting:

In addition to the basic building lighting requirements, the individual artists' studio spaces will need special display / task lighting. This can be supplied by individually controlled overhead track lighting in the studio spaces or individual receptacle circuits for tenant provided display lighting. In the auditorium area, the individualized electrical circuits can be dropped from a suspended overhead buss duct to a receptacle for tenant provided display / task lighting.

Exterior Lighting:

In addition to the basic site lighting requirements discussed above, parking lot lighting will be required around the lot in accordance with local codes. Pole mounted metal halide lighting is recommended around the site and proposed drives.

Miscellaneous Wiring and Electrical Receptacles:

In addition to fulfilling the basic electrical wiring and electrical receptacle requirements, it will be necessary to provide electrical power for the individual artist's studio equipment and electrical service to a new kitchen or lunchroom. It is anticipated and recommended that a common electrical buss duct be sized to serve both the interior lighting over the artist studio spaces as well as to provide electrical power to the individual artist studio spaces below.

Security System (Optional):

A security system, while optional, is highly recommended to insure the safety of artwork and artists working in studio spaces in facility which is anticipated to be in use 24 hours a day. Security systems provide a means of controlling the ingress and egress or artists and patrons around the clock and can be as unsophisticated as incorporating the use of interconnected door contacts and keypads. Or they can be more sophisticated by incorporating the use of card readers, motion sensors, glass vibration sensors and security cameras at additional costs. A security system could also be directly connected via telephone into a private or police monitoring station.

Special Electrical System Requirements under an 'A3' Assembly Occupancy Classification

Electrical Service:

Electrical service would have to be increased in an A3 Assembly Occupancy classification to accommodate the additional electrical load required by the stage lighting in a live performance center and the additional electrical load imposed by increased HVAC load imposed by the heat generated by the stage lighting. The detailed cost of stage lighting has not been included in this report because it is highly specialized and varies substantially in cost with respect to the level of sophistication of the production lighting proposed, however included in the scope of this investigation is the cost and necessity of providing adequate electrical service capacity to accommodate stage lighting in a live performance center.

Interior and Exterior Lighting:

The interior and exterior lighting requirements would be the same for both Business and Assembly Occupancy classified buildings except for the additional electrical loads associated with stage lighting in a live performance auditorium as discussed above.

Sound System (Optional):

A sound system would most likely be required in a live performance center. A sound system may be portable or it can be a small installed system consisting of speakers, microphone outlets, microphones, amplifier and a mixing board. The advantage of an installed sound system over a portable system is an enhanced sound quality. In either case, the electrical load associated with the sound system does not increase the electrical service requirements. A sound system would have to be designed in conjunction with acoustic treatments in the auditorium space to provide sound reverberation properties appropriate or the type of live performances anticipated in the space.

Fire Alarm:

The increased occupant load associated with an Assembly Occupancy classified building would require the addition of a fire alarm system. A fire alarm system would include pull stations, duct smoke detectors, smoke detectors, connection to a commercial kitchen hood if provided, fire sprinkler tamper sensors and flow switches. It would also be necessary to connect the fire alarm system via telephone to a monitoring station.

PLUMBING - FIRE PROTECTION EXISTING CONDITIONS / RECOMMENDATIONS:

General Description:

There are two small existing restrooms located on either side of the main entrance corridor. These restrooms currently function as the primary public restroom facilities. The restrooms have not been modernized over the years and thus do not comply with the barrier free requirements for handicapped occupants. The plumbing fixtures are in poor condition, appear to be abandoned, and do not comply with the low water consumption rate requirements for plumbing fixtures. Both restrooms are in very poor condition.

There is one large restroom that is located on the first floor southeast corner of the building, which is configured as a shower, locker room, and latrine. The shower and plumbing fixtures are in very poor condition and are considered abandoned.

On the second floor there is a small bathroom located in the southwest corner of the building. The restroom has not been modernized over the years and thus does not comply with the barrier free requirements for handicapped occupants. In addition the plumbing fixtures are in poor condition and also appear to be abandoned.

Overall, the existing plumbing system is in poor working condition, in general disrepair, and considered beyond its expected service life as most of the existing plumbing dates back to the time of construction. The plumbing fixtures thus do not comply with mandatory low water consumption rates and are not in compliance with barrier free requirements or ANSI Standards.

A floor mounted electric fired water heater is located in the boiler room on the first floor at the northeast corner of the building. The electric water heater provides domestic hot water to the building. The electric water heater is relatively new and has a 50-gallon capacity. However, the water heater does not have sufficient capacity or recovery rate to provide adequate hot water to the existing number of fixtures in the building or to support either a Business Occupancy or Assembly Occupancy classification. The existing hot water supply system also currently does not provide any existing provisions for hot water recirculation or thermal expansion. The existing water heater may be used to supply hot water to the kitchen or lunchroom, however it will not be capable of providing adequate supplies to renovated restrooms.

The existing 2" diameter domestic cold water line entering the building does not have a means of backflow prevention and also does not have enough capacity to handle any increase in water demand required by a renovated facility. Backflow prevention is required on the cold-water make-up servicing the mechanical equipment within the HVAC system. In addition, the existing

pipe insulation is in poor condition, characterized by tears and severe deterioration and non-existent in most locations.

There is an existing 2" diameter natural gas line, which is exposed in the boiler room located on the first floor northeast corner of the building. There are also external gas cocks located at equipment requiring natural gas. Where equipment requiring gas has been removed throughout the armory the gas piping has been capped and abandoned in place. While the exposed gas piping appears to be in good condition, abandoned runs and gas cocks must be removed. In addition, dielectric unions are required and should be provided between dissimilar piping materials; none are currently in use.

Roof runoff is accomplished by a combination of gutters, scuppers and downspouts. Rain runoff from the pitched auditorium roof in the located at the center of the building is directed to roof eave gutters and downspouts. The gutters and downspouts are in very poor condition. At some locations the gutters have completely deteriorated away and at some locations the downspouts are missing. The two-story forward and rear portions of the building have flat roofs with some slope provided by the elevations in the roof structure directed to drain towards through parapet scuppers. However, several scupper boxes are missing allowing roof runoff to wash down the face of the building underneath the missing roof scuppers. In addition, the overflow roof scuppers do not connect to the 4" diameter rain leaders located on the building exterior, thus also allowing roof runoff to wash down the face of the building.

All sanitary lines within the building are brought to points outside the building and are connected to the city sewer system that is routed adjacent to the site. The existing waste drain and vent piping in the building is cast iron. However, the existing cast iron piping is deteriorated, in poor condition and is considered beyond its expected service life.

Existing Fire Protection / Fire Alarm Systems:

The existing building contains one fire hose station fitted with a fifty-foot fire hose and fire nozzle. The existing fire hose station is valved and supplied from the domestic water system. The fire hose supply line has no means of backflow prevention, which would be required to be provided in a fire suppression system in a renovated facility. In addition, the armory building does not have a fire sprinkler system, or a fire alarm system. Fire hydrants are also missing throughout the building. Overall, the existing fire protection system is considered to be in poor condition and not in compliance with code requirements.

General Recommendations:

Complete renovations to the domestic cold water, domestic hot water, stormwater, sanitary, waste, vent, and gas piping systems including tie-ins to service mains within the building are required for a renovated either A-3 Assembly Occupancy or B Business Occupancy classification. It is recommended that the two existing restrooms adjacent to the main entrance corridor be expanded and fully reconstructed to provide the appropriate plumbing fixture count and facilities in full compliance with handicapped accessibility standards. It should be noted that the total plumbing fixture count would vary with occupancy classification as the fixture count is directly dependant on the building classification and subsequent occupant load dictated by the Building Code. A 'B' Business Occupancy classification will result in an occupant load of 237 people while an Assembly 'A-3' classification will result in an occupant load of 791 people. In essence, the higher the occupant load the more plumbing fixtures required. Thus, a Business Occupancy supporting working art studios would require fewer plumbing fixtures and capacity than an Assembly Occupancy supporting live performances and subsequently be more economical.

The large shower / locker / restroom located in the northeast corner of the building and adjacent to the kitchen should be abandoned as a restroom and converted into service support area for the artists' studios. We recommend installing new art room sinks complete with plaster traps.

In addition, the new building plumbing system and components should be designed and constructed in compliance with the following nationally recognized standards and code requirements;

- International Plumbing Code
- Americans with Disabilities Act
- American Society of Plumbing Engineers (ASPE)
- NFPA 54 National Fuel Gas Code

Domestic Cold Water Service:

It is anticipated that the existing building connections to site utilities shall remain. The existing 2" diameter copper domestic cold-water service which enters the building at the boiler room meets the facility's cold water and hot water demand of 52.0 gallons per minute. New 1" fiberglass pipe insulation will be installed on the existing water distribution piping.

The existing domestic water service shall be retrofitted to provide a new full size shut-off valve, a reduced pressure zone backflow preventer, ¾ inch system drain valve with hose

connection, cap and pressure gauge. No work is anticipated to the underground water service lines. The 55-psig water pressure available at the site is adequate to provide sufficient capacity to meet the facility's requirements without the need of a booster pump.

Domestic Hot Water System:

We recommend that a new electric domestic water heater be installed in the boiler room. The water heater shall have an 80-gallon storage capacity and a recovery rate of 51 gallons per hour delivery at 80 F° rise to meet the building's hot water demand of 57 GPH. The domestic hot water system shall furnish water heated to a temperature of 120° F to the facility's sinks and lavatories. To maintain an acceptable water temperature at the fixtures, a recirculation system consisting of return piping to the water heater and a circulation pump shall be provided.

Sewer System:

All sanitary and storm sewers within the building shall be extended to points outside the building. Connections to site utilities shall be at locations as indicated on the civil site drawings. Final sewer connections shall be made to the city sewer system that currently is routed adjacent to the site. A 4" diameter sanitary pipe is sufficient to handle the projected number of plumbing fixture units with a drainage profile of 1/8" slope per foot.

Natural Gas System:

We recommend that the existing natural gas meter be replaced. In addition, new gas piping, gas isolation valves, and a pressure regulator are recommended for installation on the discharge side of the new meter. We also recommend that new gas piping with sufficient capacity be routed to the hot water boiler in the boiler room and kitchen. Connection to the equipment should be installed complete with gas isolation valve, 6" dirt leg and gas piping train as recommended by natural gas equipment manufacturers.

Kitchen:

We highly recommend that the existing kitchen be renovated into a lunchroom / canteen "warming kitchen" rather than into commercial kitchen capable of food preparation on site as a commercial kitchen is governed by far more stringent code requirements resulting in substantial construction cost increases. For instance, a commercial type of kitchen would require a three-compartment stainless steel sink with a grease interceptor and commercial grade dishwasher. The dishwasher and three-compartment sink would require 140°F hot water supply temperature. This requirement would require implementing a water-mixing valve to be located adjacent to the water

heater. In addition, the Health Department would require a kitchen hand sink. Thus we recommend that if kitchen facilities are required that a warming or catering type kitchen be provided in lieu of a commercial kitchen facility to minimize construction costs.

Fire Protection System:

The requirement for a fire sprinkler system is dependent on the type of building occupancy classification. Since the existing building contains approximately 11, 870 square feet, if the occupancy for the building is designated as an A3 Assembly Occupancy yielding an occupant load of 791 people, the building would require a fire sprinkler system throughout the entire building in accordance with section 903.2.1.3 of the International Building Code. In addition to providing a fire sprinkler system, a new addressable fire alarm system must be provided as required by BOCA[9] and NFPA[10] Codes. The system shall include all equipment necessary to accomplish two local water flow alarm signals and one transmitted water flow signal from the alarm valve, and a transmitted water flow signal from each flow switch. Transmission of alarm signals shall be accomplished over the building's fire alarm transmission system and water flow signal detectors shall be compatible with the transmission system.

ENVIRONMENTAL / EXISTING CONDITIONS:

(Refer to Appendix C for the "Asbestos and Lead Based Paint Survey" and "Asbestos Operations and Maintenance Program.")

General Description:

Asbestos containing materials were discovered in the vinyl floor tile, adhesive mastics attaching the floor tile and white caulking used at several roof and wall penetrations on the exterior of the building. While these materials do not present a significant safety threat to people in the building in their present state, if left in place they must be identified and maintained as part of a formal Operations and Maintenance Plan to provide notification of the presence of asbestos to users, contractors, and maintenance personnel. While these materials are not required to be abated, they are required to be contained and managed under an Operation and Maintenance Plan. As the floor tile is generally in bad condition and will be further disturbed when various interior partitions are removed and relocated it is our recommendation that the floor tile be removed and disposed of at the time of renovation.

[9] Building Officials & Code Administrators International Building Code

In addition to the discovery of asbestos in the floor tile, severely deteriorating asbestos pipe insulation was discovered in the crawlspace under the building. If the crawlspace was used as a chase for new mechanical systems then it would be recommended that the pipe insulation be abated which would also necessitate that the exposed soil to a depth of 6 inches also be abated as it is also contaminated with asbestos fibers. However, it is our opinion that abating the crawlspace is cost prohibitive and use of the crawlspace should be limited to minimal and unavoidable penetrations electing instead to run exposed ductwork and utility services as much as possible and in a manner accentuating the existing industrial architectural aesthetic of the building. However, it would also be necessary to maintain data regarding asbestos containing material in the crawlspace as part of an Operations and Maintenance Plan as well as require warning signage placed at all entry points into the crawlspace. In concert with the discovery of asbestos containing pipe insulation in the crawlspace, it is highly likely that during construction additional asbestos containing pipe insulation may be encountered on existing concealed pipe runs throughout the building interior and thus would also require those asbestos containing materials and spaces to be properly abated and the materials disposed.

Virtually all of the painted surfaces tested were observed to have lead containing paint. The lead containing paint surfaces are not required to be removed, however if they are disturbed they must be removed and disposed of in accordance with Federal regulations and must not exceed permissible exposure limits. Similarly no asbestos containing materials are required to be abated unless disturbed and then they also must be removed in accordance with Federal regulations. Thus if the proposed facility is not regulated by the Federal Government under the Department of Housing and Urban Development, an Operations and Maintenance Plan is not required. However, we highly recommend that an Operations and Maintenance Plan be vigorously maintained whether or not required by law to protect users, contractors, maintenance personnel and their family members[11] from the unknowing and inadvertent exposure to harmful materials.

C. IMPROVEMENTS, RENOVATIONS and ESTIMATED COSTS:

The following tables address the associated costs with various improvements, and renovations necessary to implement the renovation recommendations.

[10] National Fire Protection Association.
[11] Cross contamination can occur through the dispersal of harmful fibers picked up firsthand by clothing and equipment and later commingled with clothing and equipment of third parties.

Table Reference Key

a. *(Column #1 refers to the discipline referenced; S = site, A = Architectural, M = Mechanical[12], P = Plumbing, E = Electrical, and EV = Environmental[13]).*
b. *(Column #2 provides a description and scope of the issue addressed).*
c. *(Column #3 provides recommendations and alternatives).*
d. *(Column #4 indicates the Building Code Occupancy Classification).*
e. *(Column #5 indicates an estimated construction cost. Note when tabulating totals choose only one cost associated with the appropriate occupancy classification where an item identifies more than one building occupancy classification.)*

Table 1.1 Site and Architectural Building Recommendations

No.	Description	Recommendation		Estimated Construction Cost
S1	Perimeter Fence	Repair damaged portions of fence and provide new vehicular gates and a man gate on either side of the building, and paint entire fence.	B/A3	$ 4,000
S2	Perimeter Fence / Grounds	Remove and dispose debris / remove underbrush and vines from perimeter fence.	B/A3	$ 2,000
S3	Entry sidewalk / Stairs	Repair entry sidewalk and brick stairs	B/A3	$ 2,000
S4	Parking Lot	Provide paved parking lot / striping / curbing / signage. *(Note the maximum parking that can be obtained on site is 30 spaces, thus arrangements must be made for offsite parking or a zoning variance. The City of Hampton requires 1 parking space for every 4 seats in an auditorium and 1 parking space for every 300 SF of floor area in an office / business occupancy which would necessitate providing 39 parking spaces)*	B/A3	$ 48,000

[12] Mechanical encompasses all systems and components associated with HVAC or heating, ventilating, and air conditioning.
[13] Environmental includes asbestos and lead paint survey and asbestos operations and maintenance program.

		2 of the 39 parking spaces must be accessible parking spaces. One space must be designated as van accessible.		
S5	Accessible Ramps	Accessible sidewalks, signage and ramps connecting accessible parking spaces and the street sidewalk to the main and side entrance are required.	B/A3	$ 12,000
S6	Vehicular access drives	Concrete curb cuts, access drives between street and parking lot, and directional signage	B/A3	$ 10,000
A1	Built up Roof System / Slate Roof	Repair deteriorated portions of roof; provide flood coat of bitumen, and aluminum paint coating. Replace missing slate tiles and repair loose tiles. *(These two portions of the roof will require replacement in 5 to 8 years)*	B/A3	$ 14,000
A2	Roof Flashing	Repair roof flashing and metal coping on roof parapet walls	B/A3	$ 2,000
A3	Wood ventilation louvers	Remove existing wood ventilation louvers and provide new fiberglass blanked out louvers in conjunction with new HVAC system.	B/A3	$ 1,700
A4	Wood Trim	Replace rotten rake and eave wood trim around auditorium slate roof.	B/A3	$ 2,500
A5	Exterior Doors	Remove and dispose existing doors. Provide new fiberglass insulated doors with new handicap accessible door hardware complete. Select new doors to match the aesthetic period design of the existing doors.	B/A3	$ 18,000
A6	Interior Doors	Remove existing doors and frames and provide new doors, doorframes, and door hardware complete. New door openings and hardware shall comply with handicap and fire rated requirements.	B/A3	$ 22,000
A7	Windows	Remove and dispose of existing steel windows with lead paint coating. Provide new operable aluminum windows with thermal breaks, with low – e insulated glass. Provide stainless steel sill pans and head / jamb receptors. Provide continuous	B/A3	$ 68,000

		polyurethane sealant and backer rod at perimeter of each window unit. All window hardware shall be in compliance with accessibility requirements. Window shape and profile should reflect the existing aesthetic of the period architecture.		
A8	Interior Partitions Finishes	Demolish existing partitions; reconfigure spaces to facilitate new restrooms and support spaces. Provide new ceilings, floor and wall finishes as required. Includes repairs to water damage on existing wall surfaces to remain. Includes new studio demising walls in the auditorium space.	B/A3	$ 150,000
A9	Gutters & Downspouts	Replace roof scuppers, gutters along auditorium roof eaves and downspouts.	B/A3	$ 3,500
A10	Exterior masonry repairs	Replace severely deteriorated brick units and point up deteriorated mortar cracks. Repair exterior wall cracks. Provide expansion joints at building corners as required.	B/A3	$ 24,000
A11	Exterior guardrails / handrails	Provide handrails and guardrails at handicap ramps and at rear exit stairs.	B/A3	$ 4,200
A12	Door and Window lintels	Remove and replace severely deteriorated door and window lintels. Est. Approx. 10 Total	B/A3	$ 4,500
A13	Interior Stairs	Repair stair and provide handrails in stairs at forward portion of the building and replace stairs at the rear of the building.	B/A3	$ 4,500
A14	Roll up Doors	Remove existing deteriorated and un-insulated aluminum roll up door and provide a new insulated roll up door.	B/A3	$ 3,500
A15	Signage	Provide building signage. Signage must be handicap accessible.	B/A3	$ 1,500
A16	Insulation	Provide R-19 blanket insulation under floor between floor joists in open crawlspace. *(Note, will require asbestos certified personnel during installation).*	B/A3	$ 9,500
A20	Wall finish / Insulation	Existing exposed brick masonry walls are either painted or covered with deteriorated stucco on metal lath which	B/A3	$ 45,000

		is unsightly, difficult to decorate, are uninsulated and makes it difficult to modernize the electrical system without adding extensive runs of unsightly surface mounted electrical conduit. Furred out interior surfaces of exterior walls with metal studs to provide 2" of rigid insulation and new recessed electrical conduit, receptacles and switches complete. Provide ½" gypsum wallboard. Prepare and paint new drywall surfaces.		
A21	Roof Insulation	Provide blown in R-30 roof insulation in attic space in forward and rear portion of the building. Provide roof insulation under slate roof in auditorium space.	B/A3	$ 12,000
A22	Window shade treatments	Provide window shade treatments to provide solar control	B	$ 14,000
A23	Window shade treatments	Provide window shade treatments to provide solar control and darkening of performance area	A3	$ 18,000

Table 1.2 Mechanical Recommendations

No.	Description	Recommendation		Estimated Construction Cost
M1	Scope of work includes the demolition, removal, and disposal of all existing heating and ventilation systems, equipment, and components complete.	Provide a new building wide heating, ventilating and air conditioning (HVAC) system. Heating system to include a new gas fired boiler and cooling to be provided by an air cooled chiller supported by new air handlers and pumps serving a new 4 pipe hydronic distribution system with interconnected volume air handling units and fan coil units at remote office and meeting rooms. HVAC system to include new exposed ductwork in the main auditorium space for air distribution. *(This scope of work does not include any special provisions for exhausting heat or fumes from kilns, or spray*	B	$180,000

		painting or any special temperature or humidity controls or kitchen hood exhaust / fire suppression systems for a commercial food preparation capable kitchen).		
M2	Scope of work includes the demolition, removal, and disposal of all existing heating and ventilation systems, equipment, and components complete.	Provide a new building wide heating, ventilating and air conditioning (HVAC) system. Heating system to include a new gas fired boiler and cooling to be provided by an air cooled chiller supported by new air handlers and pumps serving a new 4 pipe hydronic distribution system with interconnected volume air handling units and fan coil units at remote office and meeting rooms. HVAC system to include new exposed ductwork in the main auditorium space for air distribution. *(This scope of work does not include any special provisions for exhausting heat or fumes from kilns, or spray painting or any special temperature or humidity controls or kitchen hood exhaust / fire suppression systems for a commercial food preparation capable kitchen).*	A3	$265,000

Table 1 3 Electrical Recommendations

No.	Description	Recommendation		Estimated Construction Cost
E1	Remove existing electrical service. Provide new electrical service.	Provide new electrical service sized to support current and future projected electrical loads. Additional provisions to support electrical loads to support kilns, furnaces and or kitchen equipment.	B	$ 15,000 $ 4,000
E2	Remove existing electrical service. Provide new electrical service.	Provide new electrical service sized to support current and future projected electrical loads. Additional provisions to support electrical loads generated by stage / spot lighting	A3	$ 15,000 $ 6,000

		and additional HVAC electrical load.		
E3	Disconnect, remove and dispose of existing light fixtures and provide new lighting throughout the building.	Provide new surface mounted and suspended fluorescent interior lighting throughout the building. Provide electrical service buss, connecting lines and controlled track lighting to provide individually controlled task lighting at individual studio spaces.	B	$ 29,000 $ 8,000
E4	Disconnect, remove and dispose of existing light fixtures and provide new lighting throughout the building.	Provide new surface mounted and suspended fluorescent interior lighting throughout the building.	A3	$ 29,000
E5	Disconnect, remove and dispose of existing wall mounted light fixtures and provide new site lighting.	Provide exterior wall mounted flood lamp fixtures and wall mounted lighting at doors.	B	$ 6,000
E6	Disconnect, remove and dispose of existing wall mounted light fixtures and provide new site lighting.	Provide exterior wall mounted flood lamp fixtures and wall mounted lighting at doors.	A3	$ 6,000
E7	Provide parking lot lighting.	Provide parking lot lighting.	B	$ 10,000 *(Initial system costs may be defrayed by contracting with the Electric utility to provide parking lot lighting, however owner installed lighting is less expensive to operate).*
E8	Provide parking lot lighting.	Provide parking lot lighting.	A3	$ 10,000 *(Initial system costs may be defrayed by contracting with the Electric*

				utility to provide parking lot lighting, however owner installed lighting is less expensive to operate).
E9	Disconnect, remove and dispose of existing electrical and telephone wiring and electrical receptacles.	Provide new electrical and telephone wiring. Provide new electrical receptacles. Provide power to new tenant spaces and equipment.	B	$ 20,000 $ 6,000
E10	Disconnect, remove and dispose of existing electrical and telephone wiring and electrical receptacles.	Provide new electrical and telephone wiring. Provide new electrical receptacles.	A3	$ 20,000
E11	Security System *(Optional)*	Security System	B	$ 4,000 to $10,00
E12	Security System *(Optional)*	Security System	A3	$ 4,000 to $10,00
E13	Stage Lighting *(Optional)*	Stage Lighting	A3	$10,000 to $20,000
E14	Sound System *(Optional)*	Sound System	A3	$ 5,000 to $16,000
E15	Fire Alarm	The increased occupant loads associated with an Assembly Occupancy will require the installation of a fire alarm system complete with pull stations, duct smoke detectors and smoke detectors.	A3	$ 9,000

Table 1 4 Plumbing and Fire Protection Recommendations

No.	Description	Recommendation		Estimated Construction Cost
P1	Scope of work includes the disconnection, removal and disposal of the existing	Provide new domestic cold water service and distribution lines. Provide a new 80 gal. Electric domestic water heater and connecting distribution lines. (No work required on underground distribution	B	$ 65,000

	domestic hot / cold water, sanitary, waste, vent and natural gas systems and the provision of new water, waste, vent and gas piping systems designed and sized to support a Business Occupancy classification facility.	piping). Provide new sanitary and storm sewer lines and connect to public utility lines. Provide new gas meter, piping, isolation valve and regulator. *(This scope of work does not include provisions for a commercial kitchen facility capable of food preparation which would require a stainless steel 3 compartment sink, dishwasher, grease interceptor, hand sink, and enhanced hot water requirements).*		
P2	Scope of work includes the disconnection, removal and disposal of the existing domestic hot / cold water, sanitary, waste, vent and natural gas systems and the provision of new water, waste, vent and gas piping systems designed and sized to support an Assembly Occupancy classification facility.	Provide new domestic cold water service and distribution lines. Provide a new 80 gal. Electric domestic water heater and connecting distribution lines. (No work required on underground distribution piping). Provide new sanitary and storm sewer lines and connect to public utility lines. Provide new gas meter, piping, isolation valve and regulator. *(This scope of work does not include provisions for a commercial kitchen facility capable of food preparation which would require a stainless steel 3 compartment sink, dishwasher, grease interceptor, hand sink, and enhanced hot water requirements).*	A3	$ 140,000
FP1	Provide a fire sprinkle and fire alarm system in accordance with building code requirements for an Assembly Occupancy classified building.	Provision of a facility wide fire sprinkler system and interconnected addressable fire alarm system and equipment necessary to provide two local water flow alarm signals and one transmitted water flow signal from the alarm valve and a transmitted water flow signal from each flow switch.	A3	$ 45,000

Table 1.5 Building Environmental Recommendations

No.	Description	Recommendation		Estimated Construction Cost
EV1	Floor Tile	Remove and dispose of asbestos containing floor tile and mastic.	B/A3	$ 8,500

EV2	Sealant	Remove and dispose of asbestos containing caulking	B/A3	$ 700
EV3	Crawlspace	Remove and dispose of asbestos containing pipe insulation. *(Not recommended)*	B/A3	$ 10,000
EV4	Crawlspace	Remove and abate soil in the crawlspace to a depth of approximately 6 inches. *(Not recommended)*	B/A3	$140,000
EV5	Lead Containing Materials	Costs associated with the removal and disposal of lead containing materials Note: This will not remove all lead containing paint coatings from the facility, but will facilitate the renovation construction.	B/A3	$ 10,000

D. CONCLUSION

The existing building exterior and base structure excluding the need for repairs to the roof and exterior masonry is generally in sound condition. The building exhibits unique masonry craftsmanship common to the era of the time of construction, but quickly becoming a rarity in our urban landscape. The level of detail and design in the existing structure is also in many ways deemed cost prohibitive to recreate in modern day construction. However, due to the age of the building and the apparent lack of any ongoing modernization efforts, the existing building does not comply with barrier free handicap accessibility requirements, is in violation of many building, mechanical, electrical and mechanical code requirements, contains both asbestos and lead containing materials, and was constructed in an era without any wall, roof, or floor insulation; all expensive issues to overcome as part of a renovation program to rehabilitate the building for a new use. As with most aging structures, the cost of rehabilitation of a facility is inversely proportional to the amount of money that has been put into the facility for maintenance and renovation improvements. Thus even an adaptive reuse plan predicated on a minimal investment intent will result in a rather substantial effort and cost to satisfy mandatory code requirements to insure the

health, safety, and welfare of users and patrons to the facility. Thus as indicated in the tables above, excluding the repairs to the exterior masonry and roof we recommend that the interior be fixtures, partitions, and finishes be gutted down to the base structure prior to prior to renovation and believe that course to be the most economical and best long term investment in the building and community.

It is our opinion that the existing building based on its size, configuration, and available space for onsite parking is best suited for a Business Occupancy classification utilizing the main auditorium space to house individual working artist's studios. Due to the limited size of the stage, the increased costs associated with the fire protection, and the unavailability of onsite parking we do not recommend that the existing facility be used for live performances or that the building seek an Assembly Occupancy classification.

We believe that the existing building if renovated offers the unique opportunity to transform the existing building into a place for artists to create and visitors to observe the process of art being created, as well as provide a place for small exhibitions and group meetings. It is our opinion that the existing building aesthetic should be maintained as much as possible with the juxtaposition of the fabric of the original structure maintained but isolated from new interior finishes electrical fixtures and mechanical equipment.

While renovation of the facility at one time is less expensive as a completed project, the building could be renovated in phases. Developing the building in phases would be more expensive but could be achieved in two phases, one renovating the forward portion of the building in conjunction with the center portion of the building and a second phase renovating the rear portion of the building at a later date. Phase one in this instance would require that all exterior wall and roof repairs be included along with abatement, electrical, mechanical, plumbing and site improvements to be included and thus is not recommended.

The following table indicates the associated costs required for renovation of the existing site and building. The following cost estimates are preliminary budgetary estimates only. In many instances exact quantities were not available or within the scope of this investigation. In addition, one must bear in mind that a statement of probable construction cost for a repair and rehabilitation project lacks the precision of a cost estimate on a new construction project. For projects of this nature and complexity typical variances in accuracy are between +/-15% to 20%. There are many variables which affect the total construction cost that are difficult to quantify until the actual time of the contractor's bid and the discovery of subsequent concealed conditions. The estimate's primary value is to understand the relative differences in cost between various design options that may be presented to you for your consideration.

Table 1.6 Relative Renovation Costs for a Business Occupancy

	Description	Recommendation		Estimated Construction Cost
	B Business Occupancy	Working artist's studios and support offices and meeting rooms. *(Note, this does not include items EV3 and EV4 which include abatement of asbestos containing insulation and soil in the crawlspace)*	B	$ 818,600
	Overhead and profit	@ 10%	B	$ 81,860
	Design Services	@ 8%	B	$ 65,488
	Total	*Rounded*	B	$ 966,000

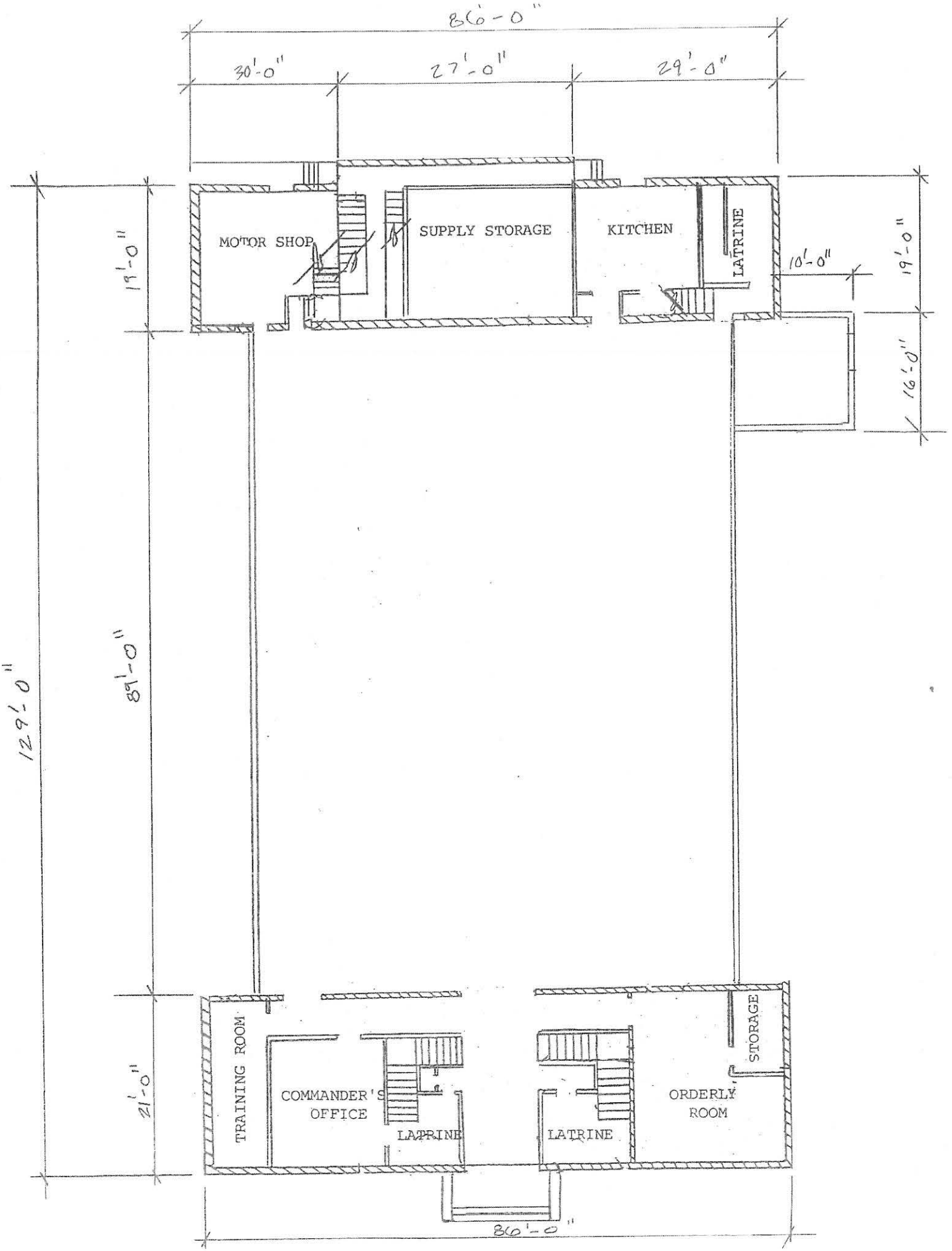
Table 1.7 Relative Renovation Costs for an Assembly Occupancy

	Description	Recommendation		Estimated Construction Cost
	A3 Accessibility Occupancy	Live performance center and support offices and meeting rooms. *(Note, this does not include items EV3*	A3	$ 1,050,600

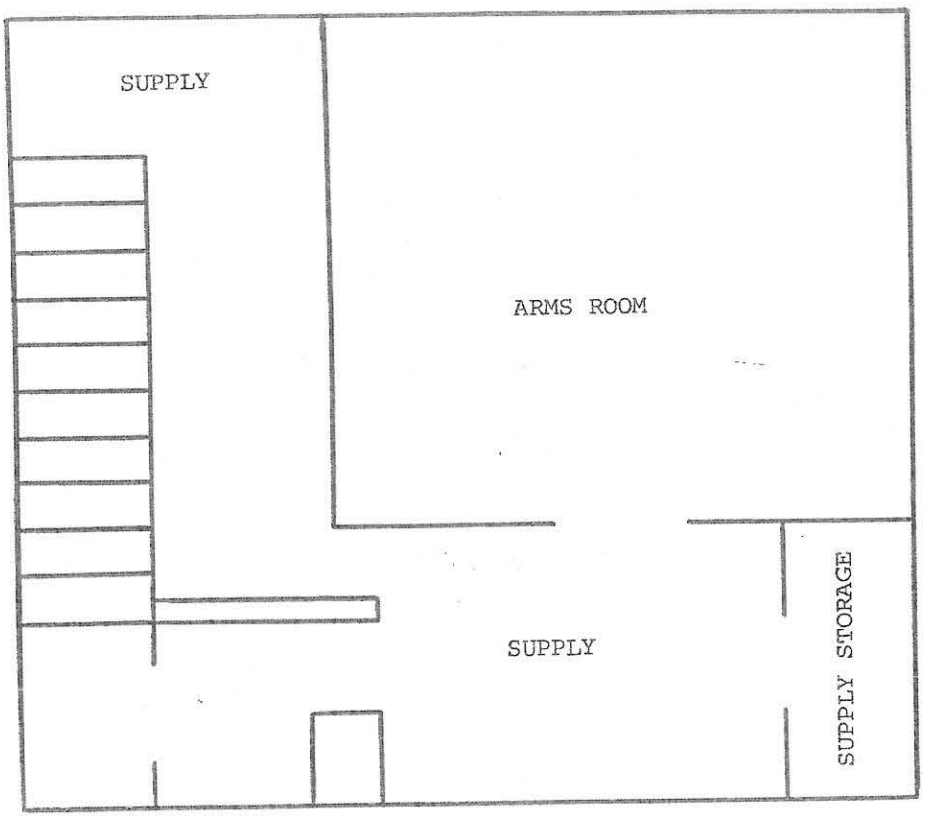
		and EV4 which include abatement of asbestos containing insulation and soil in the crawlspace) *(Note, insufficient parking is provided onsite and thus will require offsite parking or the approval of a zoning variance. Thus under current zoning, use of the facility as an Assembly Occupancy is not available without provisions for parking.)*		
	Overhead and profit	@ 10%	A3	$ 105,060
	Design Services	@ 8%	A3	$ 84,048
	Total	*Rounded*	A3	$1,240,000

~ End of Report ~

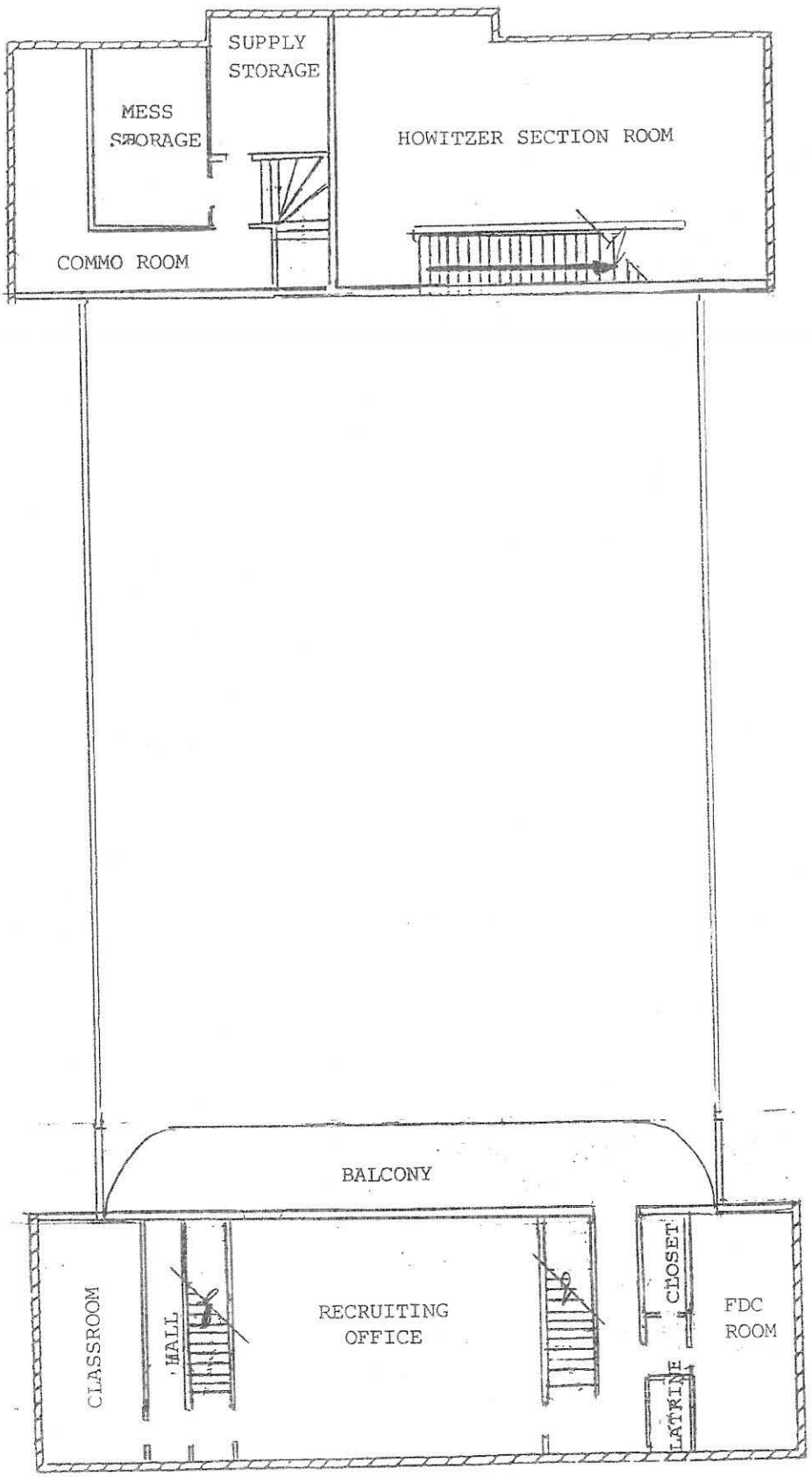
APPENDIX B – FLOOR PLAN


86'-0"
30'-0"
27'-0"
29'-0"
MOTOR SHOP
SUPPLY STORAGE
KITCHEN
LATRINE
19'-0"
10'-0"
19'-0"
16'-0"
129'-0"
89'-0"
21'-0"
TRAINING ROOM
COMMANDER'S OFFICE
LATRINE
LATRINE
STORAGE
ORDERLY ROOM
86'-0"

EVACUATION PLAN
(SUPPLY ROOM)



EMERGENCY/FIRE/POLICE 911


SUPPLY
STORAGE
MESS
STORAGE
HOWITZER SECTION ROOM
COMMO ROOM
BALCONY
CLASSROOM
HALL
RECRUITING
OFFICE
CLOSET
FDC
ROOM
LATRINE

APPENDIX C – ASBESTOS AND LEAD BASED PAINT SURVEY & ASBESTOS OPERATIONS AND MAINTENANCE PROGRAM

ASBESTOS OPERATIONS AND MAINTENANCE PROGRAM

FOR
HAMPTON ARMORY
504 KING STREET
HAMPTON, VIRGINIA

-PREPARED BY-

ENGINEERING CONSULTING SERVICES, LTD.
814-A GREENBRIER CIRCLE
CHESAPEAKE, VIRGINIA 23320

ECS PROJECT NO. 04:6618

APRIL 6, 2004

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

Appendix

PROJECT DIRECTORY

The following is a directory of the personnel involved in the facility's Operations and Maintenance Program. The names are listed in the order in which notification should take place.

	Title	Personnel
1.	Asbestos Program Manager	
2.	Building Asbestos Coordinator	
3.	Asbestos Program Consultant	Mr. John R. Lewis II ECS, Ltd. 814-A Greenbrier Circle Chesapeake, VA (757) 366-5100

1.0 INTRODUCTION

This site-specific Operations and Maintenance Manual was developed exclusively for the Hampton Armory located at 504 King Street in Hampton, Virginia. ECS, Ltd. performed an asbestos survey for the property. The purpose of the asbestos survey was to collect and analyze bulk samples from the facility to identify the presence and general location of asbestos-containing materials (ACM) in the buildings. This site-specific manual includes an O&M directory, project information, a list of the identified asbestos-containing materials in the facility and future O&M work practices. A properly conducted Operations and Maintenance Program can, in many cases, be as appropriate as an asbestos control strategy such as removal; therefore, it is important that everyone involved in the program be committed to implementing it properly.

In addition, this site specific manual includes background information on asbestos, an introduction to the O&M program, information on implementing the O&M program, O&M work practices, O&M incident and emergency work practices and O&M surveillance and documentation practices.

2.0 PROJECT INFORMATION

An asbestos survey was performed at the Hampton Armory by ECS, Ltd. of Chesapeake, Virginia dated, April 6, 2004. The asbestos survey was conducted on the entire structure. The building materials that contain asbestos are the red, black, and dark brown 9"x9" vinyl floor tile, blue 6"x6" tile and associated mastics, black roof tar/flashing material, white roof caulk around circle ornamental roof vent, checkered sheet flooring, and the pipe insulation material.

ECS was requested to prepare an O&M Plan for the Hampton Armory to properly maintain ACM in good condition, prevent release of asbestos fibers, and monitor the condition of ACM within the facility. It is our understanding that the Hampton Armory will hire an asbestos contractor for removal of ACM, if necessary. The procedures set forth are standard O&M procedures.

3.0 ASBESTOS BACKGROUND

3.1 What is Asbestos?

Asbestos is a term used to describe a group of six naturally occurring fibrous minerals (chrysotile, amosite, crocidolite, anthophyllite, tremolite and actinolite). These materials are found in certain types of rock formations. Of that general group, the minerals chrysotile and amosite have been most commonly used in building products.

3.2 Asbestos Uses In Buildings

Asbestos has been used extensively in buildings throughout the world as a component in fireproofing, insulation materials, decorative and acoustical texture, floor coverings, roofing materials and as reinforcement for plaster binders in building products. Asbestos became a popular

commercial product because of its strength, fire and corrosion resistance, and insulating qualities. In the United States, its commercial use began in the early 1900s.

3.3 Health Effects

Asbestos fibers can cause serious health problems if inhaled. Three specific diseases -- asbestosis (a fibrous scarring of the lungs), lung cancer, and mesothelioma (a cancer of the lining of the chest or abdominal cavity) have been linked to asbestos exposure. These diseases do not develop immediately after inhalation of asbestos fibers; it may be 20 to 40 years or more before symptoms appear.

3.4 Federal Regulations

Since the early 1970s, awareness of the potential health hazards associated with inhalation of airborne asbestos fibers has increased. In 1973, the Environmental Protection Agency (EPA) enacted the National Emission Standards for Hazardous Air Pollutants (NESHAPs) which banned the spray application of asbestos-containing materials, such as fireproofing, insulation and acoustical surfacing materials. Also enacted was a no visible emissions standard for building renovation and demolition.

Because of its carcinogenic nature and because of its common use in public buildings, EPA mandated in the May 27, 1982 Federal Register that all public and private schools (kindergarten through grade 12) be inspected for the presence of asbestos-containing materials. This was the first legal mandate requiring any type of action concerning asbestos in buildings.

On October 22, 1986, Congress passed the Asbestos Hazard Emergency Response Act (AHERA) which, among other provisions, required EPA to develop final asbestos rules by October 17, 1987. It included inspection, testing, establishment of an O&M Program, and in some cases, removal of asbestos.

Recent Occupational Safety and Health Administration (OSHA) regulations have been enacted for occupational exposure to asbestos. Hampton Armory is required to follow OSHA regulations in 29 CFR 1910.1001, 1915.1001 and 1926.1101 - Occupational Exposure to Asbestos Standard, to protect employees and maintenance workers. Among other things, this Standard requires that building owners do the following:

- ? identify and label asbestos containing materials;
- ? notify affected parties;
- ? maintain records of notifications;
- ? train housekeeping staff about the location of ACM and anyone exposed to levels of asbestos above the permissible exposure limit; and,
- ? designate a competent person to oversee asbestos activities.

If asbestos-containing materials are found, there is no requirement that they be addressed in a manner similar to that which Congress mandated for schools. There is an EPA requirement that

most asbestos-containing materials, with the possible exception of roofing materials, vinyl asbestos floor tiles and linoleum, be removed from a building prior to demolition. Also, there is no federal law requiring removal of asbestos currently in place in buildings.

4.0 INTRODUCTION TO THE OPERATIONS AND MAINTENANCE PROGRAM

4.1 Objective of the Operations and Maintenance Program

The principal objective of an O&M Program is to minimize exposure of building occupants to asbestos fibers. To accomplish this objective, an O&M Program includes work practices to (1) maintain ACM in good condition, (2) ensure proper cleanup of asbestos fibers previously released, if necessary, (3) prevent further release of asbestos fibers, and (4) monitor the condition of ACM.

4.2 Types of Asbestos-Containing Materials

For the purpose of the Operations and Maintenance Program, asbestos-containing materials can be placed into three major categories:

(1) Surfacing Material: Surfacing material is ACM that is sprayed or troweled onto surfaces, such as plaster, sprayed finishes, acoustical surfaces or fireproofing.

(2) Thermal System Insulation (TSI): TSI is insulation applied to pipes, boilers, tanks, and ducts to prevent heat loss, heat gain, or condensation.

(3) Miscellaneous ACM: Miscellaneous ACM is other asbestos-containing materials such as ceiling or floor tiles, floor coverings, asbestos-cement panels, asbestos siding and roofing materials.

4.3 Types of Operations and Maintenance Projects

Generally, the O&M Program is comprised of three types of projects:

No Contact with ACM Expected

Those projects which are unlikely to involve any direct contact with ACM -- for instance, floor tile in a facility. These projects can generally be handled by the custodial and maintenance staff.

Potential for Contact with ACM

Those projects which may cause accidental disturbance of ACM -- for instance, maintenance work such as painting the ceiling texture or removing and replacing damaged floor material. Since Hampton Armory will not be training an asbestos response team, these projects will require the involvement of an asbestos removal contractor.

Contact with ACM

Those projects which involve relatively small disturbances of ACM -- for instance, removing and replacing floor material. Placing new linoleum or floor tile over asbestos-containing floor tile (without removing the existing floor tile) can be performed by maintenance personnel provided they know the location of ACM and are instructed not to disturb the material. However, if these materials are to be removed (since Hampton Armory will not be training an asbestos response team), these projects will also require the involvement of an asbestos removal contractor.

Larger, more complex projects for the intentional removal of ACM are beyond the scope of an O&M Program and should be considered asbestos abatement projects. Contact the Asbestos Program Consultant for requirements.

5.0 IMPLEMENTING THE OPERATIONS AND MAINTENANCE PROGRAM

5.1 The Asbestos Program Manager

An Asbestos Program Manager should be appointed who will be responsible for maintaining the O&M Program. The Asbestos Program Manager's responsibilities are numerous and the Asbestos Program Manager will act as the decision-maker on all routine, as well as emergency, asbestos-related matters. The Asbestos Program Manager will have authority to oversee the custodial and maintenance staffs, contractors and outside service vendors with regard to all asbestos-related activities. The Asbestos Program Manager will arrange for training of on-site personnel in O&M techniques. The Asbestos Program Manager may delegate various responsibilities including documentation and record keeping to an Asbestos Program Consultant.

5.2 The Building Asbestos Coordinator

A Building Asbestos Coordinator (BAC), such as the maintenance superintendent, should be appointed to be responsible for notifying the Asbestos Program Manager of building operations that could disturb ACM or emergency, asbestos-related matters. The BAC can perform asbestos awareness training for the Asbestos Program Manager (if properly trained) and will also develop an organizational policy of key contacts within Hampton Armory consisting of maintenance staff, custodial staff, office managers, general employees and vendors.

A well-developed O&M Program is ineffective unless the BAC is committed to implementing it properly.

The BAC should convey this commitment to key personnel involved in the building's management and operations.

5.3 Cleaning

The Asbestos Program Manager should make a determination for the frequency of routine cleaning. Cleaning will only be necessary if ACM is inadvertently disturbed. If an area needs to be cleaned due to damaged ACM, an asbestos removal contractor should be contacted for cleaning.

In areas where damage or debris was observed in the initial asbestos survey, dry brooms, mops, dust cloths and standard vacuum cleaners simply re-suspend asbestos fibers into the air and therefore should not be used.

5.4 Notification

The Asbestos Program Manager and/or BAC will inform maintenance employees, tenants and contractors about the location and physical condition of the ACM that may be disturbed, and stress the need to avoid disturbing the material. Building occupants should be informed of potential asbestos hazards in their vicinity because informed persons are less likely to unknowingly disturb the material and cause fibers to be released into the air.

The BAC will inform building occupants about the presence of ACM by holding awareness or information sessions and posting signs in a common area at Hampton Armory where affected occupants can see them.

Awareness Meetings

Selected personnel shall attend an awareness/information session. This session will inform them of the presence of asbestos in their facility and the procedures Hampton Armory is taking to control it.

Employee/Tenant Letter

The employee/tenant notification letter can be mailed or posted for the Hampton Armory employees, tenants and contractors working at the facility. It is a simple method of conveying the needed information concerning the ACM within the facility (Form 1 in the Appendix).

Employee Asbestos Awareness Form

The employee asbestos awareness form is signed by all employees who are likely to come in contact with ACM. It should be completed by each facility office manager and maintenance or custodial employees of Hampton Armory or anyone else who may come in contact with ACM during maintenance or renovation activities (Form 2 in the Appendix).

All other personnel whose work may involve disturbing ACM should also sign an acknowledgment statement. This form is an example and may be modified to meet your needs. The Asbestos Program Manager will retain these forms on file for no less than 30 years as a critical document to support the owner in legal proceedings. Through the use of this acknowledgment form, Hampton

Armory is showing its intent to abide not only by EPA and OSHA regulations, but also by EPA and OSHA recommendations.

Contractor Notification Form

The contractor notification form is signed by all outside contractors, vendors, and others of the presence of ACM within your facility. This form may also be modified depending on the intended outside agents (Form 3 in the Appendix).

This form is to be signed by the contractor's superintendent or project manager and ensures that all of the contractor's workers have been informed of the presence of ACM.

Warning Signs and Restricted Areas

To minimize the chance for accidental entry into areas with a high risk of exposure, such as areas undergoing maintenance activities, warning signs should be posted and access restricted to authorized personnel only. The signs should be conspicuous and contain the business and emergency telephone numbers of the BAC. This is necessary to prevent personnel, both employees and agents, who are unaware of the presence of asbestos and its potential hazards from inadvertently disturbing any ACM.

If and when asbestos fiber release incidents occur, it is especially important for the BAC to deal with occupants and contractors openly and honestly, for that is the best way to maintain employee confidence in the facility asbestos program.

5.5 Work Permit Program

A "Work Permit" Program should be established by the Asbestos Program Manager to control all work that could disturb ACM. The "Work Permit" Program requires the person requesting the work to submit a Maintenance Work Request Form (Form 4 in the Appendix) to the BAC before any work has begun. The "Work Permit" Program should apply to work performed by Hampton Armory personnel and also by outside contractors. The BAC will notify the Asbestos Program Manager of the maintenance request.

Upon receiving a Maintenance Work Request Form, the Asbestos Program Manager and/or the BAC will take the following steps:

1. Refer to written records and the asbestos survey report to determine whether ACM is present in the area where the work will occur. If ACM is present, but it is not anticipated that the material will be disturbed, the Asbestos Program Manager should note the presence of the ACM on the permit form and provide additional instruction on the importance of not disturbing the ACM.

2. If ACM is both present and likely to be disturbed, Hampton Armory should hire an asbestos abatement contractor on an as needed basis to perform repairs or removal.

The Asbestos Program Manager or the BAC will determine what work practices should be instituted to minimize the release of asbestos fibers during the maintenance activity.

3. This determination will be recorded on a Maintenance Work Authorization Form (Form 5 in the Appendix).

4. The Asbestos Program Manager or BAC will make sure that a copy of both the request and the authorization forms (if granted) are placed in the permanent file.

5. Where the task is not covered by previously approved standard work practices, the Asbestos Program Manager or BAC will make sure that the appropriate work practices and protective measures are used for the job.

6. For all jobs where contact with ACM is likely, the BAC or an Asbestos Program Consultant representing the BAC will visit the work site when the asbestos removal contractor begins the work to see that the job is being performed properly. For lengthy jobs where disturbance of ACM is intended or likely, periodic or full-time inspections and air sampling will be required in accordance with State of Virginia asbestos removal regulations.

7. The BAC or Asbestos Program Consultant should report any deviation from standard and approved work practices. This should be recorded on an Evaluation of Work Form (Form 6 in the Appendix) and be immediately corrected and reported to the Asbestos Program Manager.

8. Upon completion of the work, a copy of the evaluation form will be placed in the permanent asbestos file for the facility.

5.6 Employee Medical Surveillance Program

It is our understanding that Hampton Armory will hire an asbestos abatement contractor to perform removal where asbestos would be disturbed. A Medical Surveillance Program would not be necessary under these conditions.

5.7 Employee Training

The Asbestos Program Manager will be required to attend formal training programs on the presence of asbestos-containing materials within the facility. Verbal notice with an acceptance signature will apply to contractors used by Hampton Armory prior to conducting work which will disturb the asbestos-containing materials. Each training program is intended for a certain group of employees depending on their exposure to the ACM in the buildings.

A. Asbestos Awareness Training

The Asbestos Awareness Training should be attended by employees that are not in day to day contact with areas with ACM. These employees would include but are not limited to:

* Administrative staff
* Maintenance staff
* Clerical Staff
* Other employees with minimal contact with ACM on a regular basis

The program presents a general awareness training for Hampton Armory employees, and would include:

* An overview of the ACM in the facility
* Health concerns
* The building owner's response to the ACM
* The role of the building employees in a successful O&M Program

The asbestos awareness program is vital to the dissemination of information to employees and tenants that have minimal contact with ACM on a day to day basis. This program should be well documented and a record of each person in attendance should be kept on file. In addition, the employee should sign a certificate stating that he understood the material presented. An example of such a certificate is located in the Appendix (Form 2).

6.0 OPERATIONS AND MAINTENANCE WORK PRACTICES

It is our understanding that the Hampton Armory will hire an asbestos abatement contractor to remove ACM, instead of training in-house personnel to perform these tasks. If an Initial Exposure Assessment has revealed the minor renovation activities that are scheduled for the property do not exceed the 0.01 F/CC EPA level, these renovations can be accomplished by a competent worker aware of the ACM.

7.0 INCIDENT AND EMERGENCY WORK PRACTICES

7.1 Introduction

Special operating practices are needed in the event of a situation which may cause an immediate release of airborne asbestos fibers. These operating procedures are needed to limit, as much as possible, contamination of the building environment and thus reduce the potential for building occupant exposure to airborne asbestos fibers. Situations of this type may be considered an incident or an emergency. An incident involves the disturbance of ACM in a small localized area. An emergency involves the disturbance of large amounts of ACM or a catastrophic occurrence. It is the responsibility of the Asbestos Program Manager

to decide whether an incident should be considered an emergency situation. The BAC and the Asbestos Program Manager will be notified of all disturbances of ACM.

7.2 Incident Procedures

In the event of an incident, the first priority will be the safety of the personnel or occupants in the area. Notify the BAC and the Asbestos Program Manager immediately, and initiate the following procedures with appropriately trained personnel:

* Evacuate and isolate the area.
* Isolate the HVAC units to the area.
* Await instructions from the Program Manager or BAC.

The Asbestos Program Manager will contact the asbestos abatement contractor to initiate the following procedures:

* If feasible or necessary, stop the cause of the disturbance.
* Clean-up the disturbed material in the affected area.
* Provide for air sampling of the affected area (Asbestos Program Consultant).

7.3 Emergency Situations

Typical situations which might represent an emergency include, but are not limited, to the following:

* Fire.
* Extensive water damage from roof leaks, pipe breaks, or other means.
* Improperly executed renovation or remodeling activities.
* Earthquake, structural failure or other catastrophic events.

7.4 Emergency Procedures

The first priority in an emergency situation is the safety of the employees and contractors. The following procedures should be initiated immediately:

* If feasible, stop the cause of the contamination (renovation work, coring, jackhammering, etc.).

* Evacuate the area, and building, if necessary.

* If possible, isolate power to the HVAC.

* Isolate the affected area by closing all doors leading to the area.

* Immediately notify the BAC and the Asbestos Program Manager and other appropriate authorities (fire department, etc.), and inform authorities of the presence of asbestos).

In the event of an emergency situation, the Asbestos Program Manager and/or the BAC will contact the asbestos abatement contractor and implement the following operating procedures.

* Isolate the area.

* Ensure all personnel have been evacuated. If someone must enter the area, only properly trained and protected personnel (respiratory protection, protective clothing, including head covering, etc.) will be allowed to enter the area.

* Isolate power to the HVAC system.

* Wait for asbestos abatement/clean-up contractor to arrive and correct the problem before reentering the evacuated area.

* If necessary, the asbestos abatement contractor, under the authority of the Asbestos Program Manager, will hire the Asbestos Program Consultant to conduct air monitoring inside and outside the contaminated area to evaluate the airborne fiber concentration. The air handling system in the affected area will remain off until airborne fiber concentrations are determined. No employee will enter the area until the contaminated area has been checked and air monitoring results indicate that the airborne fiber concentration is below a level acceptable to the building owner.

Following each emergency asbestos-related activity, an emergency abatement form should be completed and filed (Form 9 in the Appendix).

8.0 O&M SURVEILLANCE AND DOCUMENTATION

8.1 Periodic Surveillance

A regularly scheduled inspection plan will be implemented for all areas where ACM is located. The inspections are necessary so that knowledge of the condition of asbestos-containing materials is kept current. Such information is vital so that prompt and appropriate action can be initiated, if necessary, before the change in the condition of the material results in release of asbestos fibers.

The following inspection process will be required. Inspection forms will be filled out after each inspection.

Initial Building Survey

Suspect asbestos-containing materials were sampled during the initial building survey. The materials' condition and locations within the buildings were recorded in the Environmental Site Assessment dated November 12, 2002.

Daily Inspections

During the general activities performed on a daily basis, the BAC, maintenance and custodial employees should observe and become aware of the general condition of the asbestos-containing materials in the facility. They should pay particular attention to any change in material such as color change or separation from the applied surface, water damage, or damage due to routine maintenance procedures, etc. Detailed records must be maintained when a change in the material is noted during daily maintenance activities. When such changes are noted, the following must be implemented:

1. Notify the BAC that a change in the condition exists. Include information concerning date noted, location, cause of change (if known), size of area involved and any other pertinent information.

2. The BAC will immediately notify the Asbestos Program Manager who will initiate a formal inspection of the area. The Asbestos Program Manager will arrange for a qualified inspector to conduct a complete investigation of the area in question using the Building Inspection Form (Form 10 in Appendix A).

Semi-annual Inspections

Even if the informal daily inspection conducted by maintenance personnel does not indicate any changes in the asbestos-containing materials, a formal inspection must be made on a semi-annual basis by a designated employee or a qualified inspector, as determined by the Asbestos Program Manager. Semi-annual inspections provide the Asbestos Program Manager with the opportunity to identify any unreported maintenance or renovation activities which could have disturbed ACM. The potential for asbestos contamination resulting from unreported maintenance activities or renovations is reduced if they are identified and corrected soon after they have been performed.

This inspection will be conducted with a Building Reinspection Form describing the location and condition of all of the ACM within the facility (Form 11 in the Appendix). The inspection should cover all areas of the facility to review the asbestos-containing materials.

Items to note during the inspection are damage, change in friability, signs of water damage due to leaking pipes and other damage. Also, a review of the inspection record keeping system to determine if it is current should also be conducted.

Air monitoring would not be necessary unless asbestos removal is planned or during an emergency situation. Hampton Armory will hire an asbestos consultant to perform air monitoring. The licensing, training requirements and the cost of equipment may make it prohibitive to train in-house staff.

Annual Inspections

The Asbestos Program Manager should designate a trained and qualified individual to perform an annual surveillance to verify the condition of the ACM.

8.2 Record Keeping

The Asbestos Program Manager will establish a special file for the permanent records discussed in this Reference Manual. Copies of all documents relative to the O&M Program should be included in this file. This includes, but is not limited to, the following:

A. Operations and Maintenance Program

A copy of the O&M Program for the facility.

B. Inspection/Survey Report

A copy of the survey report performed for the facility which documents the locations and conditions of asbestos-containing materials should be maintained for reference by the building owner, contractors, telecommunications service personnel and appropriate inspection agencies including the Occupational Safety and Health Administration and the Environmental Protection Agency. This file should include reports of reinspections performed to monitor subsequent conditions of affected materials.

C. Abatement Activities

Records of abatement activities shall be maintained. These records shall include, as a minimum, the following information:

* Delineated abatement area
* Method of abatement
* Start date and completion date of activity
* Contractor's name

ENGINEERING CONSULTING SERVICES, LTD.
Geotechnical • Construction Materials • Environmental

April 6, 2004

Mr. George Nicholas
The TAF Group
100 Landmark Square
Virginia Beach, Virginia 23452

Reference: **Operations and Maintenance Manual for Asbestos-Containing Materials**
Hampton Armory
504 King Street
Hampton, Virginia

ECS Project No. 04:6618

Dear Mr. Nicholas:

Engineering Consulting Services, Ltd. (ECS) has completed the attached asbestos operations and maintenance (O&M) manual for the Hampton Armory located at 504 King Street in Hampton, Virginia for Occupational Safety and Health Administration (OSHA) compliance and for management of asbestos identified at the facility. This O&M manual contains the asbestos survey results, background information on asbestos, an introduction to the O&M program, information on implementing the O&M program, O&M work practices, O&M incident and emergency work practices and O&M surveillance and documentation practices. It is our understanding that any asbestos removal and/or replacement procedures will be performed by asbestos abatement contractors rather than training in-house personnel to perform these tasks. If an Initial Exposure Assessment has revealed the minor renovation activities that are scheduled for the property do not exceed the 0.01 F/CC EPA level, these renovations can be accomplished by a competent worker aware of the ACM. The O&M manual has been tailored to these conditions.

ECS appreciates the opportunity to provide asbestos services for this project. If you have any questions or need additional information, please contact us.

Respectfully,

ENGINEERING CONSULTING SERVICES, LTD.

John R. Lewis II
Virginia Asbestos Building Inspector No. #3303 002480

These plans shall be periodically reviewed and shall be updated to include the latest abatement activity.

D. Fiber Release Reports

Records confirming the report of a suspected fiber release. These reports shall include a description of the incident, the actions taken to evaluate the incident, the procedures taken to correct the incident and the results of the incident.

E. Annual Surveillance Reports

F. Air Monitoring Report, when required

Copies of all air monitoring test results to document:

1. Prevalent level airborne fiber concentrations
2. Effectiveness of abatement activities
3. Emergency investigations
4. Airborne fiber concentrations during periodic reinspections

G. Work Request Forms

Records confirming that maintenance work was requested and proof that approval was granted or denied for the maintenance activity. If the work was performed, an evaluation of the work should also be included.

H. Training Records

Records confirming the attendance of personnel at training programs shall be kept. These records shall include the nature of each program and the signature of the person attending.

On an annual basis, the overall status of the O&M Program will be reviewed. The Asbestos Program Manager will be responsible for:

1. Determining areas where asbestos-containing materials have been removed and updating the O & M program with this information.

2. Conducting a full review of the permanent files to determine if all of the necessary documents are in place.

9.0 FUTURE O&M WORK PRACTICES

Below is a list of the activities that should be performed under the O&M Program and the schedule for doing so. These activities were previously explained in detail in the O&M reference manual.

- O&M training for the Asbestos Program Manager - within 4 months.
- Employee Awareness Training - within 6 to 8 months.
- Annual Surveillance.

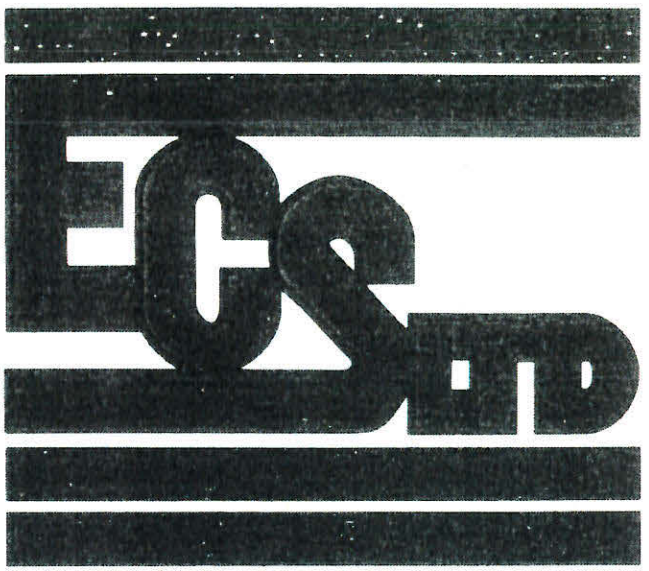
QUALIFICATION STATEMENT

Our recommendations are based on the guidelines presented in the 1990 edition of EPA's "Managing Asbestos in Place -- A Building Owner's Guide to Operations and Maintenance Programs for Asbestos-Containing Materials" (EPA 20T-2003). Any conditions discovered which deviate from the data contained in this manual should be presented to us for our evaluation.

The maintenance of asbestos-containing materials in facilities requires the input of a multi-disciplined team. Our services have been limited to the engineering aspects. We recommend that you involve your legal counsel and medical consultants to address your specific legal and medical considerations.

Engineering Consulting Services, Ltd. appreciates the opportunity to have provided these services and is looking forward to working with you in the future. Should there be any questions concerning this manual, please contact us at (757) 366-5100.

APPENDIX



ASBESTOS AND LEAD BASED PAINT SURVEY

HAMPTON ARMORY BUILDING
504 KING STREET
HAMPTON, VIRGNIA

ECS Project Number 04:6618

April 6, 2004

ENGINEERING CONSULTING SERVICES, LTD.
Geotechnical • Construction Materials • Environmental

April 6, 2004

Mr. George Nicholas
The TAF Group
100 Landmark Square
Virginia Beach, Virginia 23452

Reference: **Hazardous Materials Survey for the Hampton Armory**
504 King Street
Hampton, Virginia 23669

ECS Project No. 04:6618

Dear Mr. Nicholas:

Engineering Consulting Services, Ltd. (ECS) has completed a Hazardous Materials Survey for the Hampton Armory, located at 504 King Street in Hampton, Virginia. The purpose of this survey was to collect and analyze bulk samples to determine the presence of ACM, Lead Based Paint, PCBs, and Mercury prior to the renovation of the structure. This report describes the survey and testing procedures along with our conclusions and recommendations.

Facility Description
The subject property is developed with an approximate 12,500 square foot, two-story brick structure located at 504 King Street in Hampton, Virginia. The central portion of the structure is a single-story, auxiliary type room that encompasses approximately 6,700 square feet. The building is constructed of steel and wood frame construction with wood and concrete floors and flat rubber membrane roof and slate roof systems and brick exterior. Interior finishes consist of paint, wood, and vinyl floor tile. The entire structure with the exception of the roof is scheduled for renovation activities.

ECS was requested to perform an asbestos survey of the entire structure to identify the general location of asbestos-containing materials (ACM). The National Emission Standard for Hazardous Air Pollutants (NESHAP) requires the identification of friable ACM and nonfriable ACM likely to become friable during demolition and/or renovation activities.

ECS observed several (over 20) sealed, red bags labeled as asbestos containing materials located in the Training Room on the 1st floor of the facility. These bags are being stored by the City of Hampton to be removed by Waco, Incorporated at a later date. The bags came from off-site locations where the City of Hampton abated vinyl floor tile. These bags were observed to be in good condition with no evidence of tears or residue around them. These bags should be disposed of in accordance with all local, State, and Federal regulations. Persons that are not trained to handle asbestos containing materials should not disturb these bags.

Asbestos Survey Procedures
A survey of the specified areas to identify suspect ACM was performed by Mr. John R. Lewis II (VA Asbestos Inspector #3303 002480), of ECS on March 17, 2004. The survey consisted of walking through the interior and the exterior of the structure to observe accessible areas for the presence of suspect materials which may contain asbestos. The survey involved detecting friable materials (materials which can be pulverized or reduced to a powder by hand pressure when dry) and non-friable materials (materials which pose a hazard when sawn, sanded, drilled or pulverized). The materials that were sampled during this survey consisted of the red, black, and dark brown 9"x9" vinyl floor tile, blue 6"x6" tile and associated

mastics, plaster wall system, white and pink window glazing, textured and checkered sheet flooring, textured wall material, roof tar, white roof caulk, and pipe insulation.

In order to determine if suspect materials observed during the visual survey contained asbestos, representative samples were collected and placed in sealed packages and delivered with a Chain-of-Custody to Environmental Hazards Services, L.L.C. of Richmond, Virginia. A total of sixteen (16) bulk samples were collected for laboratory analysis. Five (5) of these samples contained multiple layers, so the total number of samples that were analyzed is twenty-one (21).

Laboratory Procedures

Bulk samples collected were analyzed in the laboratory using the EPA recommended method of Polarized Light Microscopy (PLM) coupled with dispersion staining (Method No. EPA 600/R-93/116). Environmental Hazards Services, L.L.C. participates in the National Voluntary Laboratory Accreditation Program (NVLAP).

Asbestos Survey Results

The EPA classifies materials containing more than one percent (1%) asbestos as ACM. The samples that contain asbestos fibers are the red, black, and dark brown 9"x9" vinyl floor tile, blue 6"x6" tile and associated mastics, black roof tar/flashing material, white roof caulk around circle ornamental roof vent, checkered sheet flooring, and the pipe insulation material.

The vinyl floor tile and associated mastics, checkered sheet flooring, black roof tar/flashing materials, and white roof caulk located around the circle vent are considered Category I, non-friable materials. These materials do not appear to pose a significant threat to human health or the environment in their current state. If the renovation activities that are scheduled for the structure are expected to impact these materials, these materials must be abated by a licensed abatement contractor in accordance with local, State, and Federal regulations. These materials may remain in the structure provided a site specific Operations and Maintenance Plan is developed to manage these materials. All persons authorized to enter the structure (e.g., owners, contractors, and maintenance personnel) should be notified of the presence of asbestos, and informed not to disturb existing ACM.

The pipe insulation located in the crawl space of the structure is considered a friable material. This material was observed to be in very poor condition, hanging off the pipes, and laying on the ground surface. If renovation activities are scheduled for the crawl space, ECS recommends this material be removed from the building as soon as possible to reduce the risk of exposure. This material can remain in place if every entrance to the crawl space is sealed and plackarded with warning signs identifying the area to contain asbestos. Persons should not enter the crawl space without the proper training or personal protective equipment. ECS did not conduct destructive testing within the wall system to identify if the pipe insulation is located within the wall system. Further investigation may be prudent to identify if this material is located within the walls prior to renovation activities. ECS recommends the pipe insulation be removed by a licensed asbestos abatement contractor in accordance with federal, state, and local regulations. ECS recommends consulting a professional demolition/renovation contractor, which is licensed to abate asbestos-containing materials in the State of Virginia. All of the quantities that are identified in the Summary Table are estimates and should be verified by the asbestos abatement contractor. All persons authorized to enter the structure (e.g., owners, contractors, and maintenance personnel) should be notified of the presence of asbestos, and informed not to disturb existing ACM. The laboratory analytical results are included in Appendix V - Summary of Asbestos Survey and Bulk Sample Analysis Sheets (Attachments).

Qualifications of Asbestos Survey

This report summarizes our evaluation of the conditions observed at the site. The findings prepared by ECS are based upon our observations at the site and analysis of the samples collected at the time of this survey. Additional ACM may exist (undetected) in other portions of the facility; however, due to inaccessibility and undetectable change in materials, and/or occupancy of the building these potential areas could not be surveyed at this time. Our recommendations are based on the guidelines presented in the 1985 edition of EPA's "Guidance for Controlling Asbestos-Containing Materials in Buildings" (EPA 560/5-85-024). Any conditions discovered which deviate from the data contained in this report should be presented to us for our evaluation.

Lead Paint Survey

A survey of the on-site structure was performed by Mr. John R. Lewis II, of ECS on March 17, 2004. The lead-based paint survey was performed by scraping and collecting paint chips from interior and exterior surfaces from the above referenced structure. Representative samples were placed in sealed plastic bags and submitted under chain-of custody protocol to the contract laboratory, Environmental Hazards Services, LLC of Richmond, Virginia for Total Lead analysis by NIOSH Method 7082m.

A total of twelve (12) samples were obtained from the structure. The paint that was sampled during this survey consisted of the white, gray, tan, brown, silver, dark brown, red, and green paint located throughout the structure. All of these samples were reported to contain lead above the laboratory's detectable concentrations. The analytical results are summarized in the attached Table 2 of Appendix II.

ECS recommends that, prior to any renovation or demolition activity which will disturb the paint material, an initial worker exposure assessment be performed in accordance with the current OSHA standard 29 CFR 1926.62. Prior to the results of the initial exposure assessment, workers should be protected with proper personal protective equipment (PPE) as outlined in this standard. Should this assessment indicate airborne lead concentrations to be in excess of the established action level of 30 micrograms of lead per cubic meter of air over an 8 hour time weighted average, appropriate worker PPE must be maintained. Under the OSHA Regulation 29 CFR 1926 (Lead Exposure in Construction; Interim Final Rule) "Where the employer has previously monitored for lead exposures within the last twelve months during work operations conducted under workplace conditions closely resembling the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in the employer's current operations, the employer may rely on such earlier monitoring results".

All persons (e.g., owners, contractors, maintenance personnel) should be notified of the presence of lead paint in the referenced areas, and informed not to disturb existing paint. Prior to disposal of lead paint, a composite sample of the lead-based paint should be analyzed for Toxicity Characteristic Leachate Procedure (TCLP) for Lead. This analysis will determine the appropriate method of disposal for this material. Lead-based painted debris (building materials) does not need to be tested for lead prior to the disposal of the materials in a construction and demolition (C&D) landfill.

PCBs and Mercury Survey

ECS personnel field verified the long fluorescent light ballasts located in the "orderly room" were not affixed with a sticker indicating them as non-PCB containing. As such, these ballasts are assumed to contain PCBs. ECS also field verified the remaining, shorter type fluorescent light ballasts to be affixed with a sticker indicating them as non-PCB containing. ECS field verified there were no pad-mounted electrical transformers located within the facility. ECS field verified that there were no mercury containing thermostats located within the structure. The PCB's containing light ballasts should be disposed of in accordance with State and Federal regulations.

UST Investigation

The subject site was reported by the Department of Environmental Quality (DEQ) to have been the subject of a pollution complain (PC# 90-0457). It was reported that in February of 1990, a 1,000 gallon, gasoline containing UST was removed from the site as the result of a failed tank tightness test. The UST was removed from the property and disposed of off site. Marine Chemist obtained three (3) soil samples, two (2) from the UST tank pit and one (1) from the stockpiled soil from the excavation for Total Petroleum Hydrocarbon (TPH) analysis. All three (3) soil samples exhibited TPH concentrations of below the detection limits. As such, the UST pit was filled with excavated soil from the tank pit. The DEQ closed this case on May 7, 1990. Based upon the UST and petroleum impacted soil being removed from the property this former UST is not considered a recognized environmental concern for the subject site.

ECS appreciates the opportunity to provide our asbestos services for this project. If you have any questions or need additional information, please contact us at (757) 366-5100.

Respectfully,

ENGINEERING CONSULTING SERVICES, LTD.

John R. Lewis II
Staff Geologist (VA Asbestos Inspector #3303 002480)

T. Christopher Hahn R.E.M.
Vice President, Branch Manager

APPENDIX I

Table I – Summary of Suspect ACM

Laboratory Analysis

Chain of Custody

Table 1 Table of Suspect ACM Sampling and Analytical Results

Visually Observed Suspect Material	Sampled & Analyzed Yes/Yes	Sample No. & Locations	Lab Results % Asbestos & Type	Estimated Quantity of ACM (sf/lft)	Friable Yes/No	Physical Condition	Fiber Release Potential
Red 9"x9" VFT	Yes/Yes	AB-1(a) 1st Floor Recruiter's Office	3% Chrysotile	450	No	Good	Low
Black Mastic Assoc. w/ Red VFT	Yes/Yes	AB-1(b) 1st Floor Recruiter's Office	NAD	N/A	N/A	Good	N/A
Black 9"x9" VFT	Yes/Yes	AB-2(a) 1st Floor Recruiter's Office	3% Chrysotile	450	No	Good	Low
Black Mastic Assoc. w/ Black VFT	Yes/Yes	AB-2(b) 1st Floor Recruiter's Office	2% Chrysotile	450	No	Good	Low
Dark Brown 9"x9" VFT	Yes/Yes	AB-3(a) 1st Floor Latrine	5% Chrysotile	450	No	Good	Low
Black Mastic Assoc. w/ Dark Brown VFT	Yes/Yes	AB-3(b) 1st Floor Latrine	2% Chrysotile	450	No	Good	Low

NAD- No Asbestos Detected
N/A- Not Applicable
VFT- Vinyl Floor Tile

Table 1 Table of Suspect ACM Sampling and Analytical Results

Visually Observed Suspect Material	Sampled & Analyzed Yes/Yes	Sample No. & Locations	Lab Results % Asbestos & Type	Estimated Quantity of ACM (sf/lft)	Friable Yes/No	Physical Condition	Fiber Release Potential
Black Roof Tar/Flashing	**Yes/Yes**	**AB-4 Roof Under Eve, Along King Street**	**5% Chrysotile**	**Est. 8,000**	**No**	**Good**	**Low**
White Roof Caulk	**Yes/Yes**	**AB-5 Caulk Around Circle Vent on Roof**	**2% Chrysotile**	**20 lf**	**No**	**Fair**	**Low**
Plaster Wall System	Yes/Yes	AB-6 1st Floor Latrine	NAD	N/A	N/A	Poor	N/A
Pink Window Glazing	Yes/Yes	AB-7 2nd Floor Hallway	NAD	N/A	N/A	Fair	N/A
Plaster Wall System	Yes/Yes	AB-8 2nd Floor Hallway	NAD	N/A	N/A	Poor	N/A
Blue 6"x6" VFT	**Yes/Yes**	**AB-9(a) 2nd Floor Latrine**	**3% Chrysotile**	**120**	**No**	**Fair**	**Low**
Black Mastic assoc. w/ Blue VFT	Yes/Yes	AB-9(b) 2nd Floor Latrine	NAD	N/A	N/A	Fair	N/A
White/Gray Window Glazing	Yes/Yes	AB-10 Gymnasium Windows	NAD	N/A	N/A	Fair	N/A

NAD- No Asbestos Detected
N/A- Not Applicable
VFT- Vinyl Floor Tile

Table 1 Table of Suspect ACM Sampling and Analytical Results

Visually Observed Suspect Material	Sampled & Analyzed Yes/Yes	Sample No. & Locations	Lab Results % Asbestos & Type	Estimated Quantity of ACM (sf/lft)	Friable Yes/No	Physical Condition	Fiber Release Potential
Terrazzo Style Sheet Flooring	Yes/Yes	AB-11 2nd Floor Unit Supply Room	NAD	N/A	N/A	Fair	N/A
Checkered Sheet Flooring	**Yes/Yes**	**AB-12(a) 2nd Floor Howitzer Section Room**	**20% Chrysotile**	**900**	**No**	**Fair**	**Low**
Yellow Mastic for Checkered Sheet Flooring	Yes/Yes	AB-12(b) 2nd Floor Howitzer Section Room	NAD	N/A	N/A	Good	N/A
Textured Wall Material	Yes/Yes	AB-13 2nd Floor Howitzer Section Room	NAD	N/A	N/A	Good	N/A
Pipe Insulation	**Yes/Yes**	**AB-14 Crawl Space**	**15% Chrysotile**	**12,500**	**Yes**	**Poor**	**High**
Pipe Insulation	**Yes/Yes**	**AB-15 Crawl Space**	**15% Chrysotile**	**12,500**	**Yes**	**Poor**	**High**
White Window Glazing	Yes/Yes	AB-16 Gymnasium Windows	NAD	N/A	N/A	Fair	N/A

NAD- No Asbestos Detected
N/A- Not Applicable
VFT- Vinyl Floor Tile

ENVIRONMENTAL HAZARDS SERVICES, L.L.C.

7469 WHITE PINE ROAD - RICHMOND, VA 23237
804-275-4788 FAX 804-275-4907

BULK ASBESTOS SAMPLE ANALYSIS SUMMARY

CLIENT: Engineering Consulting Services, Ltd.
814-A Greenbrier Circle
Chesapeake, VA 23320

DATE OF RECEIPT: 18 MAR 2004
DATE OF ANALYSIS: 20 MAR 2004
DATE OF REPORT: 21 MAR 2004

CLIENT NUMBER: 48-1701 A
EHS PROJECT #: 03-04-2361
PROJECT: 04:6618

EHS SAMPLE #	CLIENT SAMPLE #/ LABORATORY GROSS DESCRIPTION	% ASBESTOS	OTHER MATERIALS
01A	AB-1(a)-Tile/ Red Vinyl	3% Chrysotile 3% Total Asbestos	97% Non-Fibrous
01B	AB-1(b)-Mastic/ Black Adhes.	NAD	100% Non-Fibrous
02A	AB-2(a)-Tile/ Black Vinyl	3% Chrysotile 3% Total Asbestos	97% Non-Fibrous
02B	AB-2(b)-Mastic/ Black Adhes.	2% Chrysotile 2% Total Asbestos	8% Cellulose 90% Non-Fibrous
03A	AB-3(a)-Tile/ Brown Vinyl	5% Chrysotile 5% Total Asbestos	95% Non-Fibrous
03B	AB-3(b)-Mastic/ Black Adhes.	2% Chrysotile 2% Total Asbestos	98% Non-Fibrous
04	AB-4/ Black Tar-Like	5% Chrysotile 5% Total Asbestos	95% Non-Fibrous
05	AB-5/ White Powder	2% Chrysotile 2% Total Asbestos	98% Non-Fibrous
06	AB-6/ Gray Gran.	NAD	100% Non-Fibrous
07	AB-7/ Red Powder	NAD	100% Non-Fibrous
08	AB-8/ White Powder; Gray Gran.	NAD	100% Non-Fibrous
09A	AB-9(a)-Tile/ Brown Vinyl	3% Chrysotile 3% Total Asbestos	97% Non-Fibrous
09B	AB-9(b)-Mastic/ Black Adhes.	NAD	100% Non-Fibrous

ENVIRONMENTAL HAZARDS SERVICES, L.L.C.

CLIENT NUMBER: 48-1701 A
EHS PROJECT #: 03-04-2361
PROJECT: 04:6618

EHS SAMPLE #	CLIENT SAMPLE #/ LABORATORY GROSS DESCRIPTION	% ASBESTOS	OTHER MATERIALS
10	AB-10/ Gray Gran.	NAD	100% Non-Fibrous
11	AB-11/ Yellow Linoleum	NAD	100% Non-Fibrous
12A	AB-12(a)-Linoleum/ Gray Linoleum; Gray Fib.	20% Chrysotile 20% Total Asbestos	80% Non-Fibrous
12B	AB-12(b)-Mastic/ Yellow Adhes.	NAD	100% Non-Fibrous
13	AB-13/ White Powder	NAD	100% Non-Fibrous
14	AB-14/ White Powder; Fib.	15% Chrysotile 15% Total Asbestos	15% Fibrous Glass 70% Non-Fibrous
15	AB-15/ White Powder; Fib.	15% Chrysotile 15% Total Asbestos	10% Fibrous Glass 75% Non-Fibrous
16	AB-16/ White Powder	NAD	100% Non-Fibrous

QC SAMPLE: M2-1999-2

QC BLANK: SRM 1866 Fiberglass

REPORTING LIMIT: 1% Asbestos

METHOD: Polarized Light Microscopy, EPA Method 600/R-93/116 *

ANALYST: Feng Jiang, M.S.

Reviewed By Authorized Signatory: Irma Faszewski

Howard Varner, Laboratory Director
Irma Faszewski, Quality Assurance Coordinator
David Xu, MS, Senior Chemist
Feng Jiang, MS, Senior Geologist
Michael A. Mueller, Quality Assurance Manager

ENVIRONMENTAL HAZARDS SERVICES, L.L.C.

CLIENT NUMBER: 48-1701 A
EHS PROJECT #: 03-04-2361
PROJECT: 04:6618

Results represent the analysis of samples submitted by the client. Sample location, description, area, volume, etc., was provided by the client. This report cannot be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government. This report shall not be reproduced except in full, without the written consent of Environmental Hazards Services, L.L.C. California Certification #2319 NY ELAP #11714. All information concerning sampling location, date, and time can be found on Chain-of-Custody. Environmental Hazards Services, L.L.C. does not perform any sample collection.

Environmental Hazards Services, L.L.C. recommends reanalysis by point count (for more accurate quantification) or Transmission Electron Microscopy (TEM), for enhanced detection capabilities) for materials regulated by the EPA NESHAP (National Emission Standards for Hazardous Air Pollutants) and found to contain less than ten percent (<10%) asbestos by polarized light microscopy (PLM). Both services are available for an additional fee.

* All California samples analyzed by Polarized Light Microscopy, EPA Method 600/M4-82-020, Dec. 1982.

LEGEND NAD = no asbestos detected
SCF = suspected ceramic fibers

plm1.dot/07JAN2002/ MR

ENVIRONMENTAL HAZARDS SERVICES, L.L.C.

7469 Whitepine Road, Richmond, Virginia 23237 Phone (804) 275-4788 Fax (804) 275-4907

CHAIN OF CUSTODY FORM

16 PLM

EHS 03-04-2361

Company Name:	Engineering Consulting Services, Ltd.	***Date:***	March 17, 2004
Address:	814-A Greenbrier Circle	***Contact Name:***	Jack Lewis
City, State, Zip:	Chesapeake, VA 23320	***Sampler Name:***	Jack Lewis
EHS Client Account #:	48-1701	***Project Name:***	04:6618
Phone # (757) 366-5100	***Fax#*** (757) 366-5203	***P.O. #:***	

		Asbestos					Lead						Other Metals (Specify metals below)							
Sample Number	**Sample Date**	**Bulk ID by PLM**	**Asbestos wipe**	**Fiber Count (PCM)**	**TEM Air**	**TEM Chatfield (Bulk)**	**Air**	**Paint**	**Soil**	**Wipe**	**TCLP(Pb)**	**Waste Water**	**TCLP RCRA 8**						**Air Volume (L) OR Wipe Area (ft^2) OR Scrape Area (cm^2)**	**Comments**
AB-1	03/17/04	X																		
AB-2	"	X																		
AB-3	"	X																		
AB-4	"	X																		
AB-5	"	X																		
AB-6	"	X																		SAMPLE CONDITION ✓
AB-7	"	X																		~~Acceptable~~
AB-8	"	X																		~~Unacceptable~~
AB-9	"	X																		
AB-10	"	X																		

Released by: John R. Lewis II	Signature:	Date: March 17, 2004
Received by:	Signature:	Date:
Released by:	Signature:	Date:
Received by:	Signature:	Date: 3-18-04 9am

FILE NO. 114 03/22 04 10:34 LD.

ENVIRONMENTAL HAZARDS SERVICES, L.L.C.

7469 Whitepine Road, Richmond, Virginia 23237 Phone (804) 275-4788 Fax (804) 275-4907

CHAIN OF CUSTODY FORM

Company Name:	Engineering Consulting Services, Ltd.	***Date:***	March 17, 2004
Address:	814-A Greenbrier Circle	***Contact Name:***	Jack Lewis
City, State, Zip:	Chesapeake, VA 23320	***Sampler Name:***	Jack Lewis
EHS Client Account #:	48-1701	***Project Name:***	04:6618
Phone # (757) 366-5100	***Fax#*** (757) 366-5203	***P.O. #:***	

Sample Number	Sample Date	Asbestos: Bulk ID by PLM	Asbestos: Asbestos wipe	Asbestos: Fiber Count (PCM)	Asbestos: TEM Air	Asbestos: TEM Chatfield (Bulk)	Lead: Air	Lead: Paint	Lead: Soil	Lead: Wipe	Lead: TCLP(Pb)	Lead: Waste Water	Other Metals (Specify metals below): TCLP RCRA 8	Other Metals	Other Metals	Other Metals	Other Metals	Air Volume (L) OR Wipe Area (ft^2) OR Scrape Area (cm^2)	Comments
AB-11	03/17/04	X																	
AB-12	"	X																	
AB-13	"	X																	
AB-14	"	X																	
AB-15	"	X																	
AB-16	"	X																	

Released by: John R. Lewis II	Signature:	Date: March 17, 2004
Received by:	Signature:	Date:
Released by:	Signature:	Date:
Received by:	Signature:	Date: 3-18-04 9a

FILE NO.114 03/22 04 12:34 PM

APPENDIX II

Table I – Summary of Lead Based Paint Survey

Laboratory Analysis

Chain of Custody

Table 2. Results of Lead Based Paint Analysis

Lab Sample No.	ECS Sample No.	Area Sampled/Color	Concentration (% Lead)
01	LB-1	Interior Wall Upper Half, Hallway by Commanders Office (White)	0.29
02	LB-2	Interior Floor, Commanders Office, (Gray/Blue)	0.34
03	LB-3	Interior Wall Lower Half, Hallway by Commanders Office, (Tan)	0.18
04	LB-4	Interior Wall, Upper Half, Commanders Office, (White)	1.2
05	LB-5	Interior Wall, 2nd Floor Hall by Classroom, (Brown)	0.11
06	LB-6	Interior Wall, 2nd Floor Hall by Classroom, (White)	0.15
07	LB-7	Interior Floor, 2nd Floor Hallway, (Brown)	1.6
08	LB-8	Interior Ceiling, Gymnasium, (Silver)	0.14
09	LB-9	Interior Wall, Gymnasium Paint on Brick, (Dark Brown)	0.76
10	LB-10	Interior Wall, Gymnasium Paint on Brick, (White)	0.39
11	LB-11	Interior Floor in Kitchen, (Red)	1.5
12	LB-12	Exterior Windows and Doors, (Green)	0.98

ENVIRONMENTAL HAZARDS SERVICES, L.L.C.

7469 WHITE PINE ROAD - RICHMOND, VA 23237
804-275-4788 FAX 804-275-4907

LEAD IN PAINT ANALYSIS SUMMARY

CLIENT: Engineering Consulting Services, Ltd.
814-A Greenbrier Circle
Chesapeake, VA 23320

DATE OF SAMPLING: 17 MAR 2004
DATE OF RECEIPT: 18 MAR 2004
DATE OF ANALYSIS: 18 MAR 2004
DATE OF REPORT: 19 MAR 2004

CLIENT NUMBER: 48-1701 A
EHS PROJECT #: 03-04-2362
PROJECT: 04:6618

EHS SAMPLE#	CLIENT SAMPLE#	SAMPLE WEIGHT (g)	CONCENTRATION (% BY WEIGHT)
01	LB-1	0.204	0.29
02	LB-2	0.232	0.34
03	LB-3	0.231	0.18
04	LB-4	0.300	1.2
05	LB-5	0.257	0.11
06	LB-6	0.234	0.15
07	LB-7	0.229	1.6
08	LB-8	0.205	0.14
09	LB-9	0.300	0.76
10	LB-10	0.298	0.39
11	LB-11	0.241	1.5
12	LB-12	0.248	0.98

QUALITY CONTROL DATA	
BATCH#:	031804P-2
INCLUSIVE EHS SAMPLE NUMBERS:	01-09
Continuing Calibration Verification 10 (10.0ppm Pb)	102% Recovery
Continuing Calibration Verification 5 (5.00ppm Pb)	107% Recovery
Laboratory Control Standard	111% Recovery
Matrix Spike	112% Recovery
Duplicate Relative Percent Difference	7.41 RPD
Reporting Limit	20.0ug
Method Detection Limit	2.0ug

ENVIRONMENTAL HAZARDS SERVICES, L.L.C.

CLIENT NUMBER: 48-1701 A
EHS PROJECT #: 03-04-2362
PROJECT: 04:6618

QUALITY CONTROL DATA	
BATCH#:	031804P-3
INCLUSIVE EHS SAMPLE NUMBERS:	10-12
Continuing Calibration Verification 10 (10.0ppm Pb)	102% Recovery
Continuing Calibration Verification 5 (5.00ppm Pb)	105% Recovery
Laboratory Control Standard	99.5% Recovery
Matrix Spike	99.2% Recovery
Duplicate Relative Percent Difference	0.404 RPD
Reporting Limit	20.0ug
Method Detection Limit	2.0ug

PREPARATION METHOD: EPA 600/R-93/200
ANALYSIS METHOD: EPA SW846 7420

ANALYST: Bayard Vandegrift

Reviewed By Authorized Signatory:

Howard Varner, Laboratory Director
Irma Faszewski, Quality Assurance Coordinator
David Xu, MS, Senior Chemist
Feng Jiang, MS, Senior Geologist
Michael A. Mueller, Quality Assurance Manager

This method has been validated for sample weights of 0.020g or greater. When samples with a weight of less than that are analyzed those results fall outside of the scope of accreditations.

Sample results denoted with a "less than" (<) sign contain less than 20.0ug total lead, based on a 40ml sample volume.

LEGEND g = gram; ml = milliliter; ug = microgram; Pb = lead; ppm = parts per million

ENVIRONMENTAL HAZARDS SERVICES, L.L.C.

7469 Whitepine Road, Richmond, Virginia 23237 Phone (804) 275-4788 Fax (804) 275-4907

CHAIN OF CUSTODY FORM

12DBpaint **EHS 03-04-2362**

SAMPLE CONDITION
Acceptable
Unacceptable

Company Name:	Engineering Consulting Services, Ltd.	***Date:***	March 17, 2004
Address:	814-A Greenbrier Circle	***Contact Name:***	Jack Lewis
City, State, Zip:	Chesapeake, VA 23320	***Sampler Name:***	Jack Lewis
EHS Client Account #:	48-1701	***Project Name:***	04:6618
Phone # (757) 366-5100	***Fax#*** (757) 366-5203	***P.O. #:***	

		Asbestos					Lead						Other Metals (Specify metals below)							
Sample Number	Sample Date	Bulk ID by PLM	Asbestos wipe	Fiber Count (PCM)	TEM Air	TEM Chatfield (Bulk)	Air	Paint	Soil	Wipe	TCLP(Pb)	Waste Water	TCLP RCRA 8					Air Volume (L) OR Wipe Area (ft^2) OR Scrape Area (cm^2)	Comments
LB-1	03/17/04							X											
LB-2	"							X											
LB-3	"							X											
LB-4	"							X											
LB-5	"							X											
LB-6	"							X											
LB-7	"							X											
LB-8	"							X											
LB-9	"							X											
LB-10	"							X											

Released by: John R. Lewis II	Signature:	Date: March 17, 2004
Received by:	Signature:	Date:
Released by:	Signature:	Date:
Received by:	Signature:	Date: 3-18-04 9a

ENVIRONMENTAL HAZARDS SERVICES, L.L.C.
7469 Whitepine Road, Richmond, Virginia 23237 Phone (804) 275-4788 Fax (804) 275-4907

CHAIN OF CUSTODY FORM

Company Name:	Engineering Consulting Services, Ltd.	***Date:***	March 17, 2004
Address:	814-A Greenbrier Circle	***Contact Name:***	Jack Lewis
City, State, Zip:	Chesapeake, VA 23320	***Sampler Name:***	Jack Lewis
EHS Client Account #:	48-1701	***Project Name:***	04:6618
Phone # (757) 366-5100	***Fax#*** (757) 366-5203	***P.O. #:***	

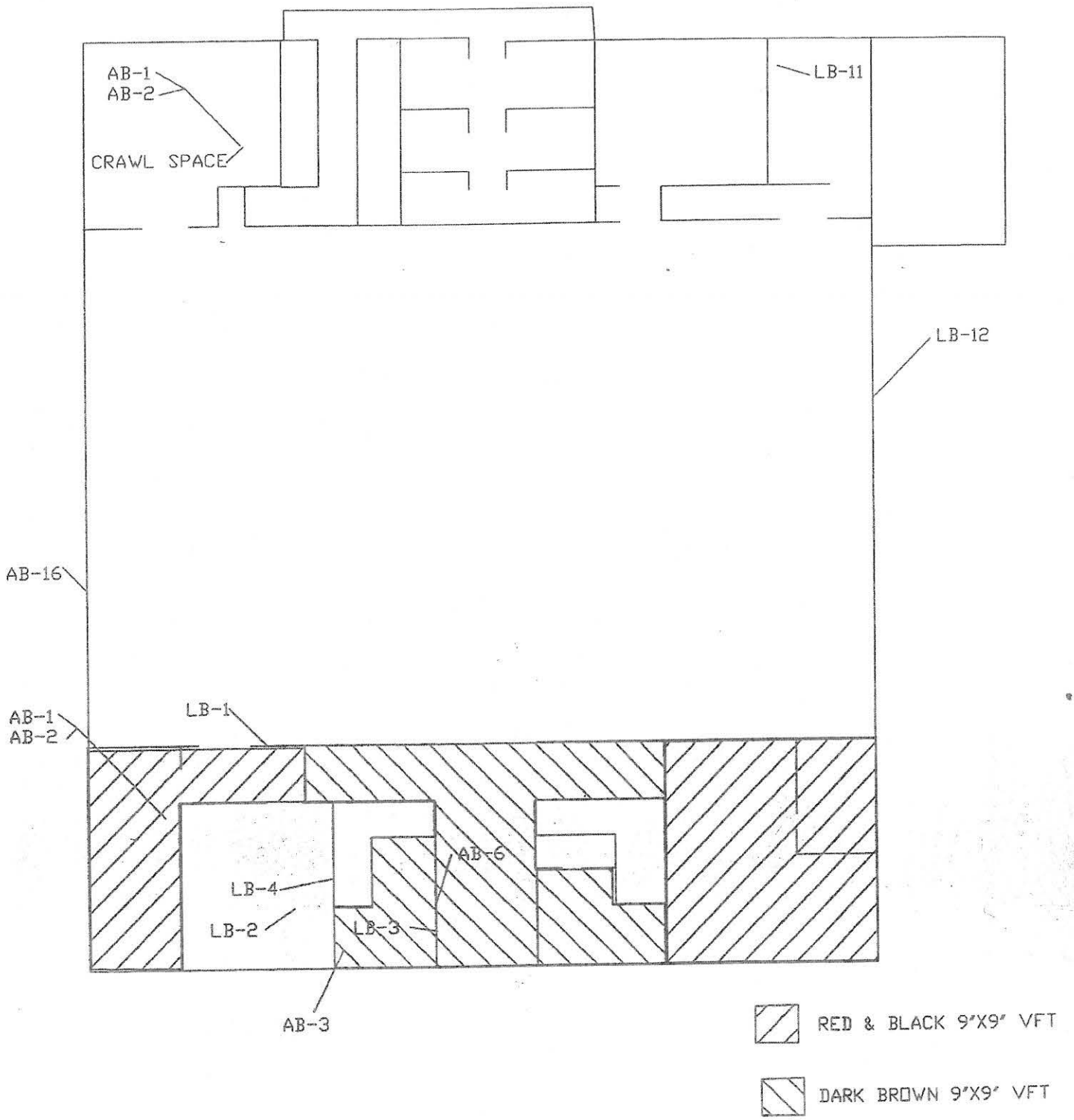
		Asbestos					Lead						Other Metals (Specify metals below)							
Sample Number	Sample Date	Bulk ID by PLM	Asbestos wipe	Fiber Count (PCM)	TEM Air	TEM Chatfield (Bulk)	Air	Paint	Soil	Wipe	TCLP(Pb)	Waste Water	TCLP RCRA 8					Air Volume (L) OR Wipe Area (ft^2) OR Scrape Area (cm^2)	Comments
1 LB-11	03/17/04							X											
2 LB-12	"							X											
SK 3/18/04																			

Released by: John R. Lewis II	Signature: John R. Lewis II	Date: March 17, 2004
Received by:	Signature:	Date:
Released by:	Signature:	Date:
Received by:	Signature:	Date: 3-18-04 aa

APPENDIX III

Figure 1 – Sample Location Map 1st Floor

Figure 2 – Sample Location Map 2nd Floor



ASBESTOS & LEAD BASED PAINT SURVEY

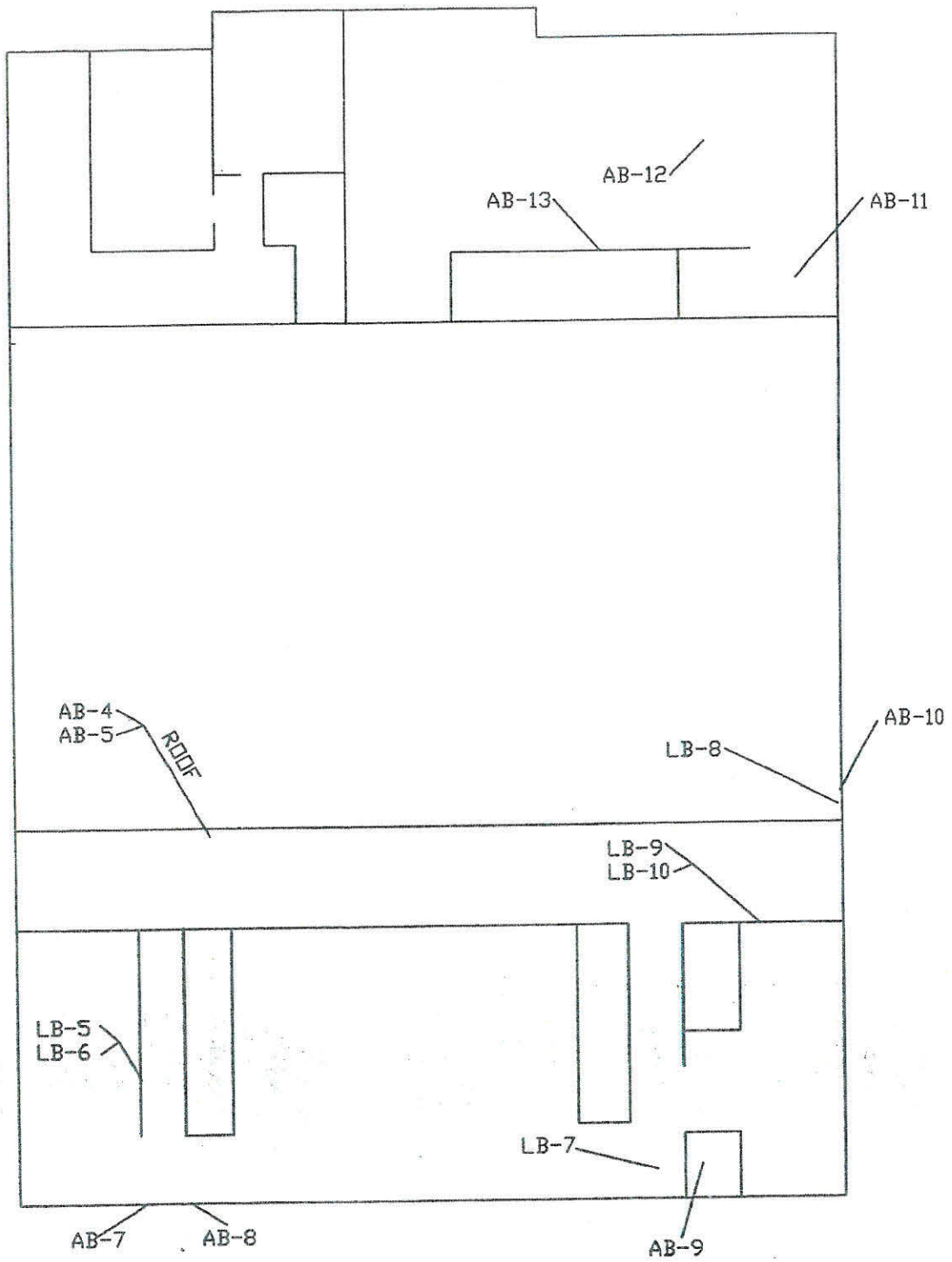
HAMPTON ARMORY
504 KING STREET
HAMPTON, VIRGINIA

ECS LTD
ENGINEERING CONSULTING SERVICES, LTD

FIGURE 1

ASBESTOS & LEAD PAINT SAMPLE LOCATION MAP 1ST FLOOR

ECS PROJECT NO. 04:6618



ASBESTOS & LEAD BASED PAINT SURVEY

HAMPTON ARMORY
504 KING STREET
HAMPTON, VIRGINIA

ECS LTD
ENGINEERING CONSULTING SERVICES, LTD

FIGURE 2

ASBESTOS AND LEAD PAINT SAMPLE LOCATION, 2ND FLOOR

ECS PROJECT NO. 04:6618

COPY

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
TIDEWATER REGIONAL OFFICE
5636 Southern Boulevard, Virginia Beach, Virginia 23462
(757) 518-2000 Fax (757) 518-2103
www.deq.virginia.gov

Preston Bryant
Secretary of Natural Resources

David K. Paylor
Director

Francis L. Daniel
Regional Director

July 26, 2007

Ms. Susan Borland
Senior Development Manager
Dept. of Economic Development, City of Hampton
One Franklin Street, Suite 600
Hampton, VA 23669

Re: **Phase II Environmental Site Assessment**
Site Name/Location: Former Hampton Armory / 518 N King Street/Hampton
DEQ Tracking Number: PC# 1990-0457

Dear Ms. Borland:

Thank you for providing the findings of your Phase II Environmental Site Assessment for the referenced site to the Department of Environmental Quality (DEQ) along with your letter dated July 20, 2007.

The results of the Phase II ESA do not provide documentation of a new petroleum release or additional petroleum contamination at the site. Based upon the available information, the State Water Control Board acting through the DEQ, as authorized by CODE § 62.1-44.34:14 through 23 has determine that contamination levels at this site do not warrant further corrective action. Pollution Complaint case PC# 1990-0457 was closed by DEQ on May 7, 1990 and still remains closed after our recent review of the files. Should future environmental problems occur, which the DEQ determines are related to a petroleum release at this location, additional investigation and corrective action may be required in accordance with State Law.

If persons developing or otherwise working on this property excavate soil or withdraw groundwater, such media must be properly sampled, analyzed, managed and disposed of in accordance with applicable waste regulations.

If you have any questions, please contact me at (757) 518-2190.

Sincerely,

Rebecca E. Gehring
Geologist
Remediation Program

cc: File PC# 1990-0457